

GZA GeoEnvironmental of New York

# Coastal Assessment and Resiliency Plan\* (CARP)



Town of East Hampton, New York

Workshop #1: Coastal Resilience  
and Adaptation Strategies

Focus Areas:

Gerard Drive/Louse Point  
Lazy Point/Napeague  
Cranberry Hole Road

28 October 2019

\* This project is being prepared with funding provided by the New York State Department of State under Title 11 of the Environmental Protection Fund.

Gerard Drive  
Nor'easter, March 2017

IMAGE: Kyril Bomley, 27east



# Stakeholder and Public Outreach

3 public workshops focused by representative CARP Focus Areas:

- ✓ **Workshop 1** – Gerard Drive/Louse Point, Lazy Point/Napeague, and Cranberry Hole Road
- ✓ **Workshop 2** – Montauk Hamlet: Downtown Montauk, Fort Pond, Ditch Plains, Soundview Drive/Captain Kidds Path and Culloden Point
- ✓ **Workshop 3** – Wainscott and Village of East Hampton

# Workshop 1 Agenda

- I. Review Project Goals and Scope
- II. Present CARP project framework
- III. Brief overview of coastal hazards
- IV. Detailed workshop/discussion of Focus Areas:
  - Gerard Drive/Louse Point
  - Lazy Point/Napeague
  - Cranberry Hole Road



# CARP Benefits



**\$1** on mitigation saves  
**\$6** in future disaster costs

National Institute of Building Sciences Natural Hazard Mitigation Saves: 2017 Interim Report



# Coastal Resilience and Adaptation Framework

## Resilience and Climate Adaptation Strategies

### **Accommodate:**

Allowing flood inundation to occur, but protecting infrastructure, property and natural resources from damage through permanent and interim measures implemented on an on-going basis. Social, land use and financial management, on an adaptive basis, to maintain Town viability and vitality, and avoid insolvency. Maintaining Town capabilities, on an adaptive basis, including public works, essential and lifeline utilities and emergency services.

### **Protect:**

A range of interventions designed to hold back flooding from inundating developed areas and preventing erosion and loss of land.

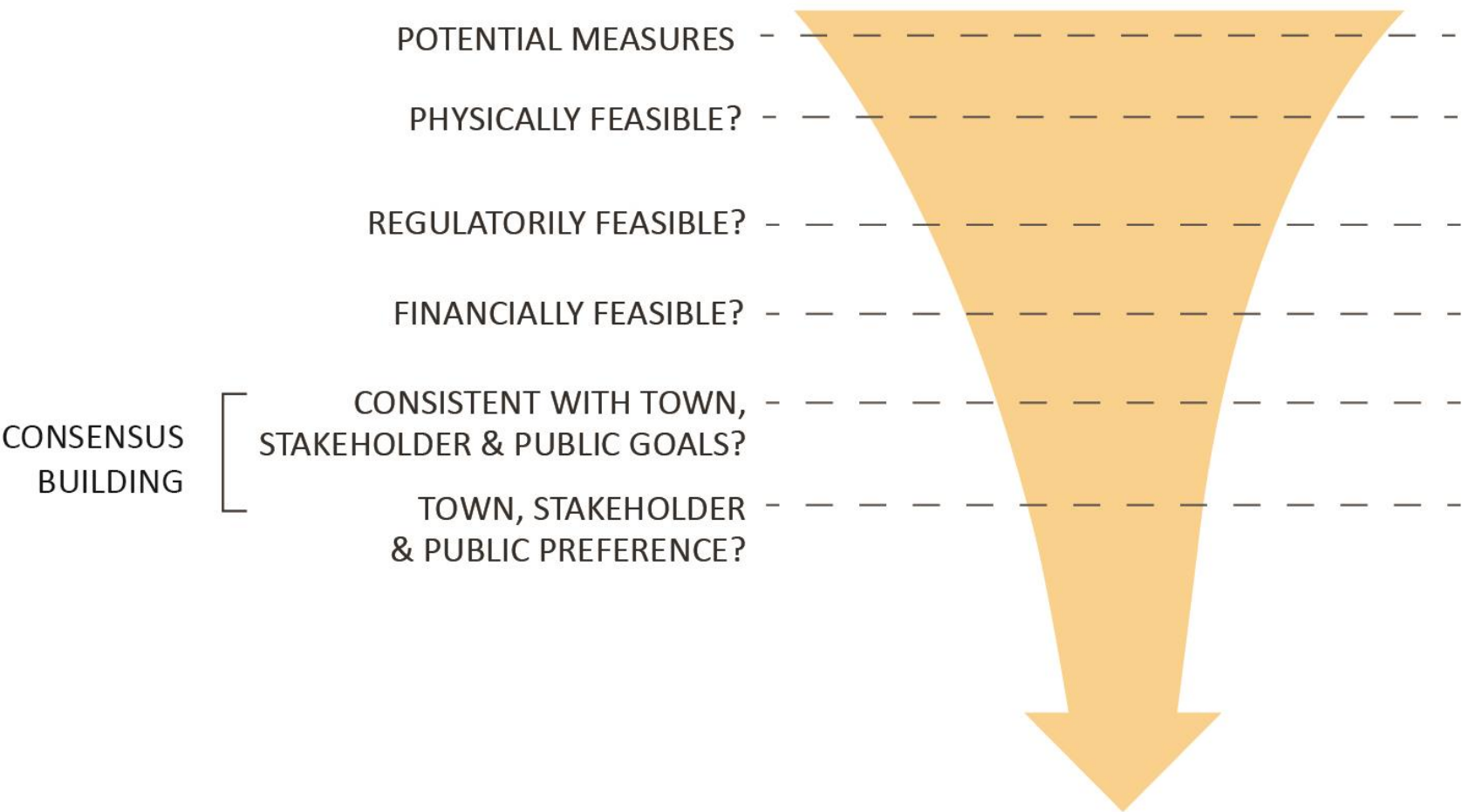
### **Managed Retreat:**

Managed withdrawal from coastal areas, most often accompanied by adaptive land use and managed relocation.

# Coastal Resilience and Adaptation Framework

## Implementation: Measures and Actions

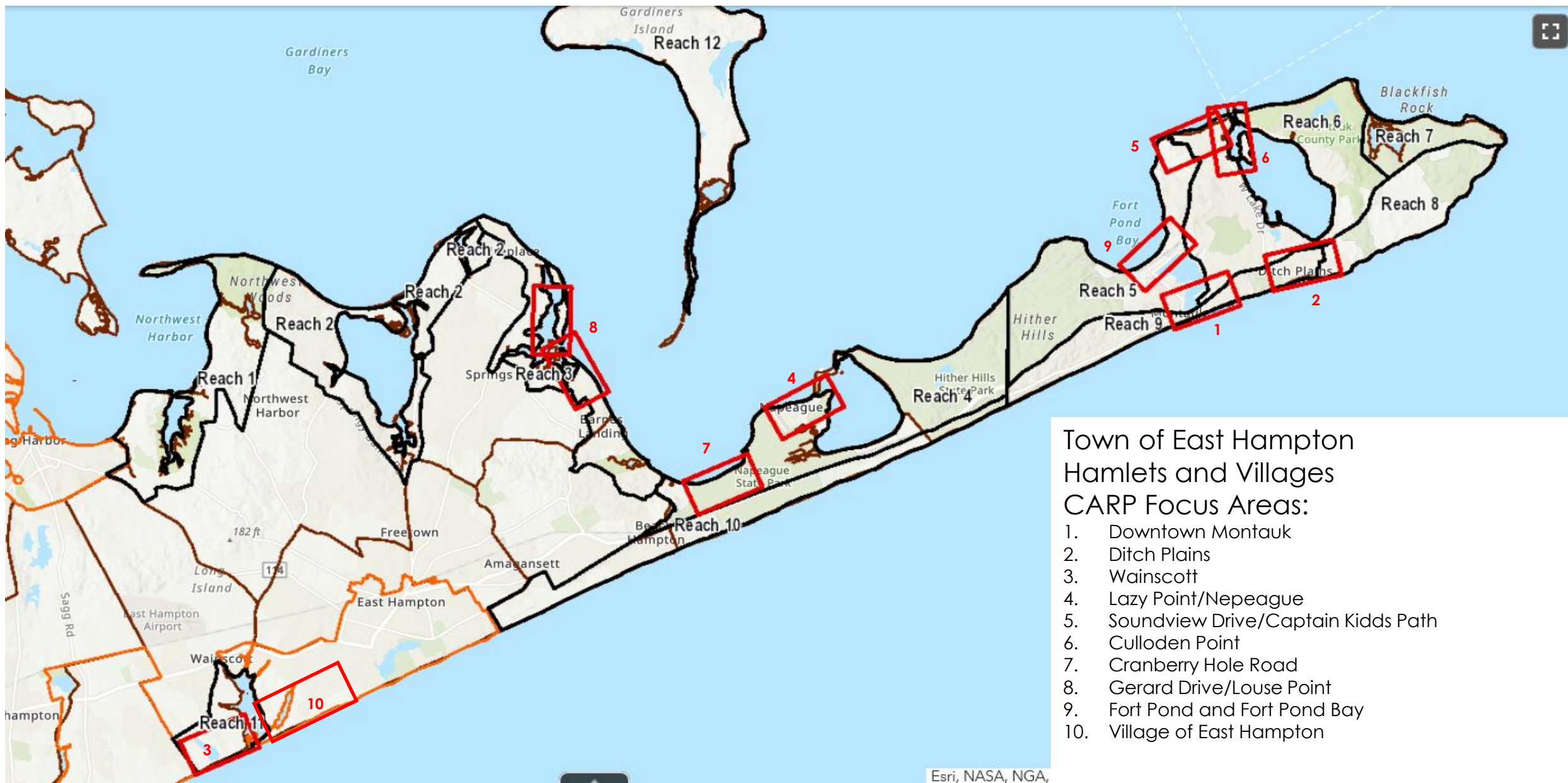
### DECISION MAKING PROCESS



## CARP Focus Areas



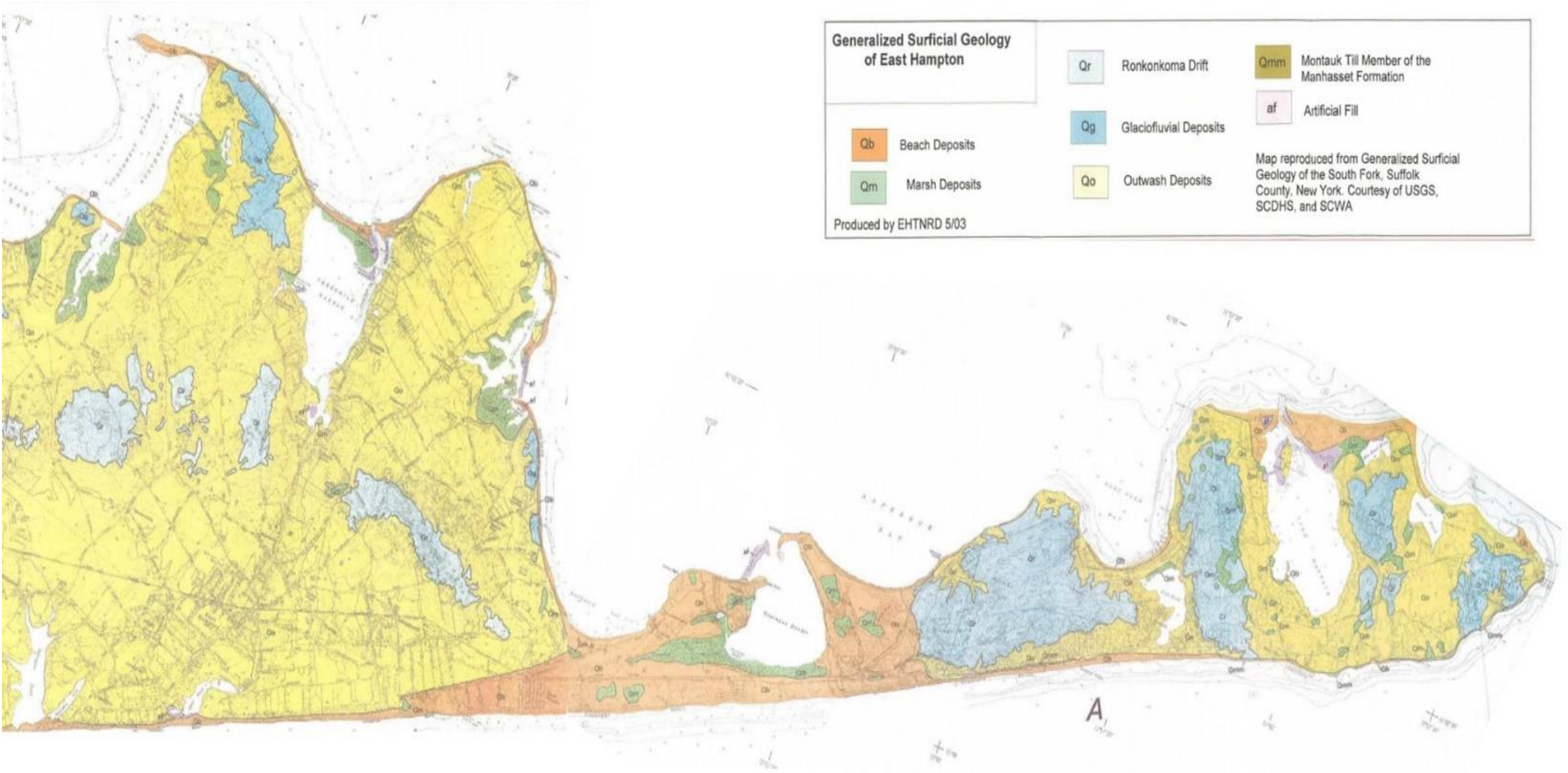
# CARP Focus Area



Esri, NASA, NGA,

# Coastal Hazard Overview

# East Hampton Geology

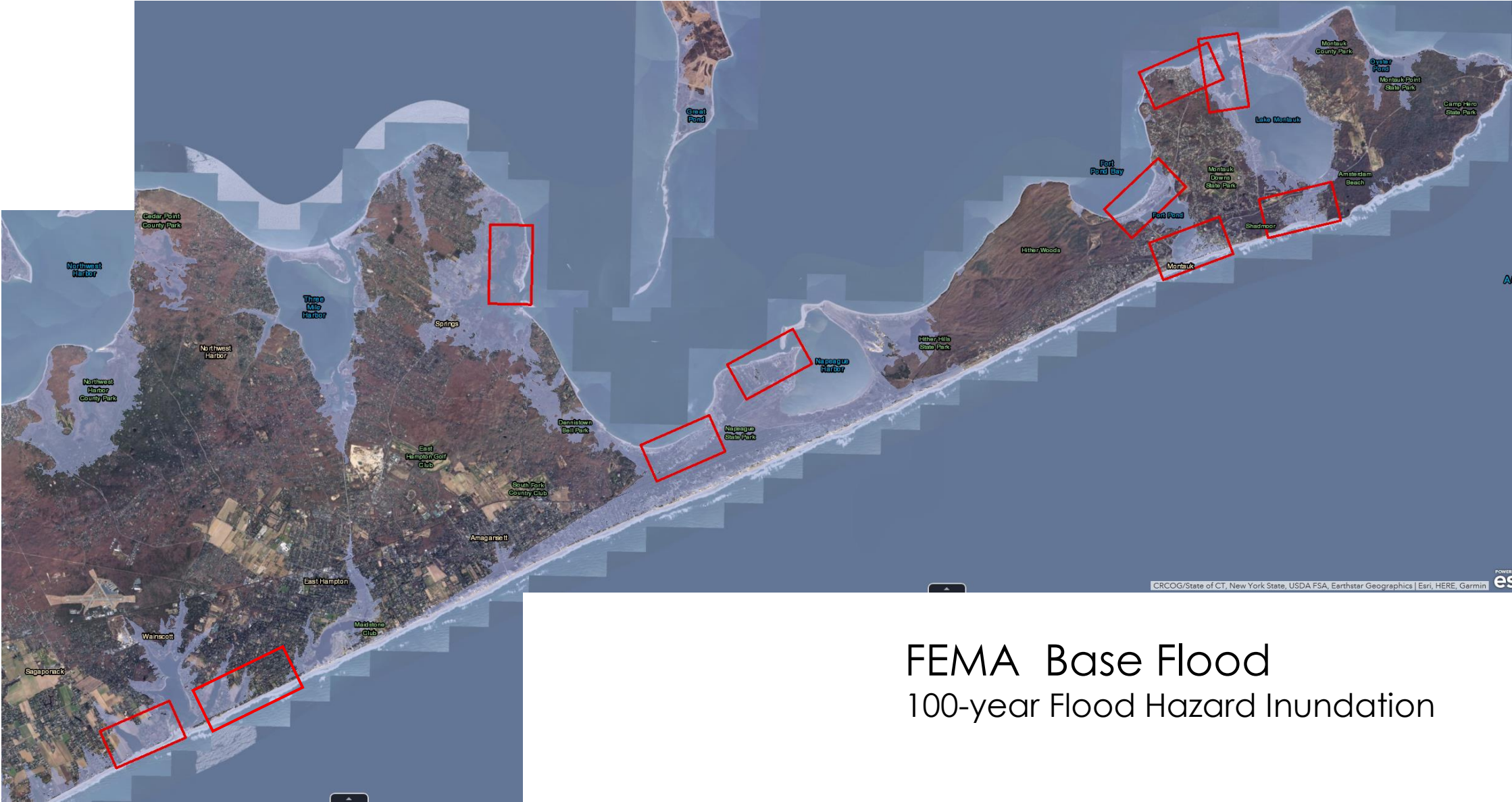




# East Hampton Topography



# East Hampton Coastal Flooding

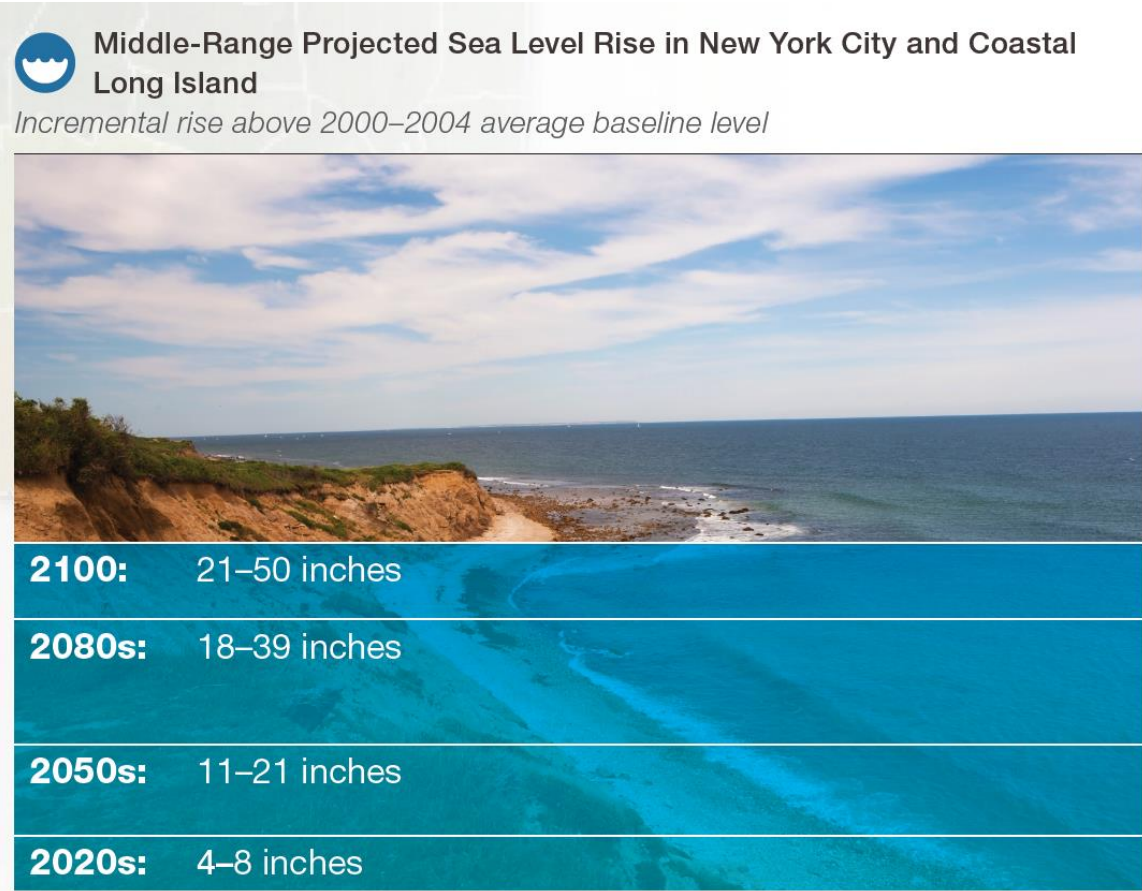


FEMA Base Flood  
100-year Flood Hazard Inundation



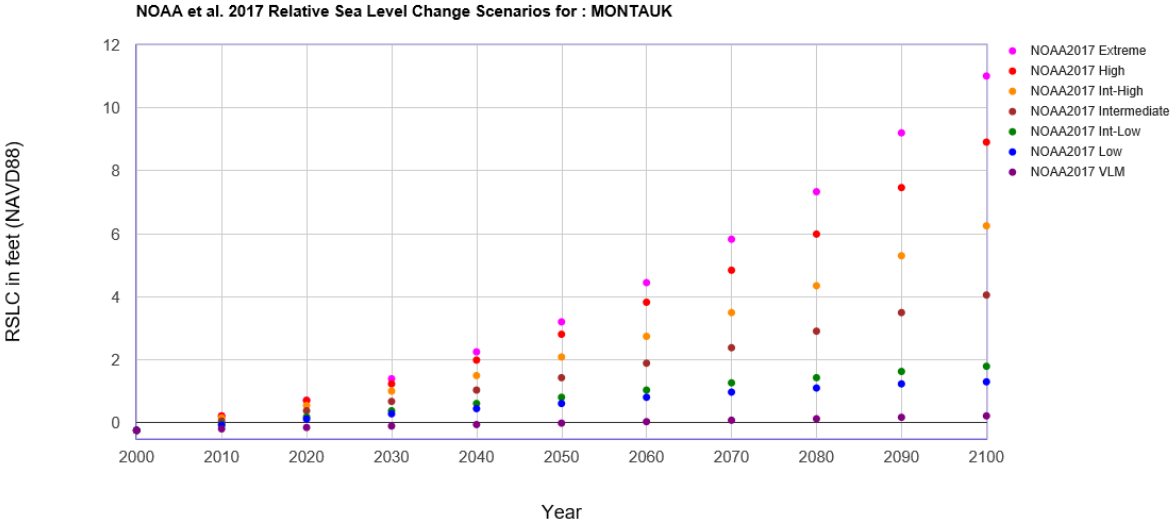
# East Hampton Projected Sea Level Rise

NYSERDA



1 foot (MHHW = 2 feet NAVD88):	Year 2040
2 feet (MHHW = 3 feet NAVD88):	Years 2060 to 2065
3 feet (MHHW = 4 feet NAVD88):	Year 2080
4 feet (MHHW = 5 feet NAVD88):	Year 2100

## NOAA 2017



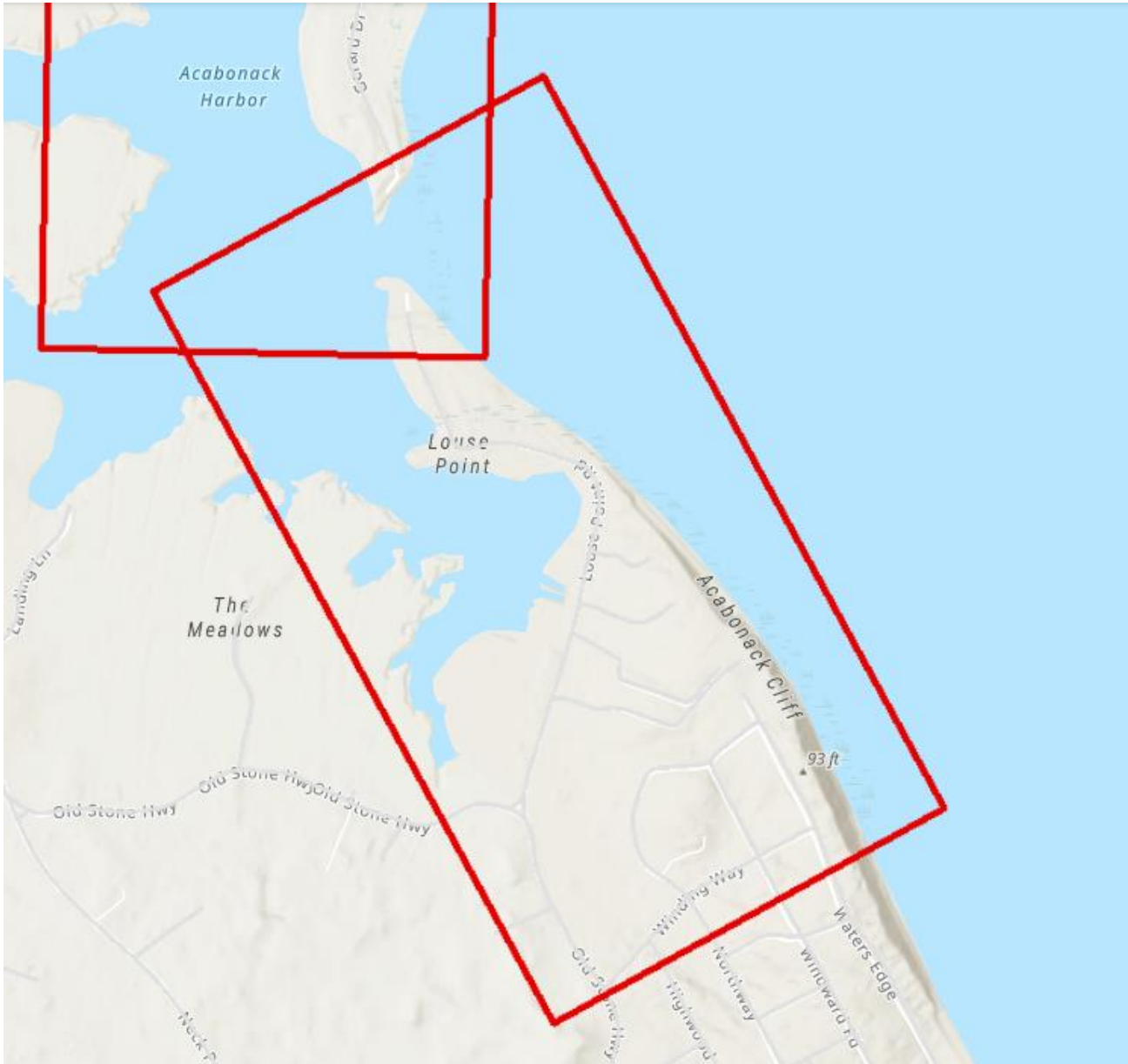
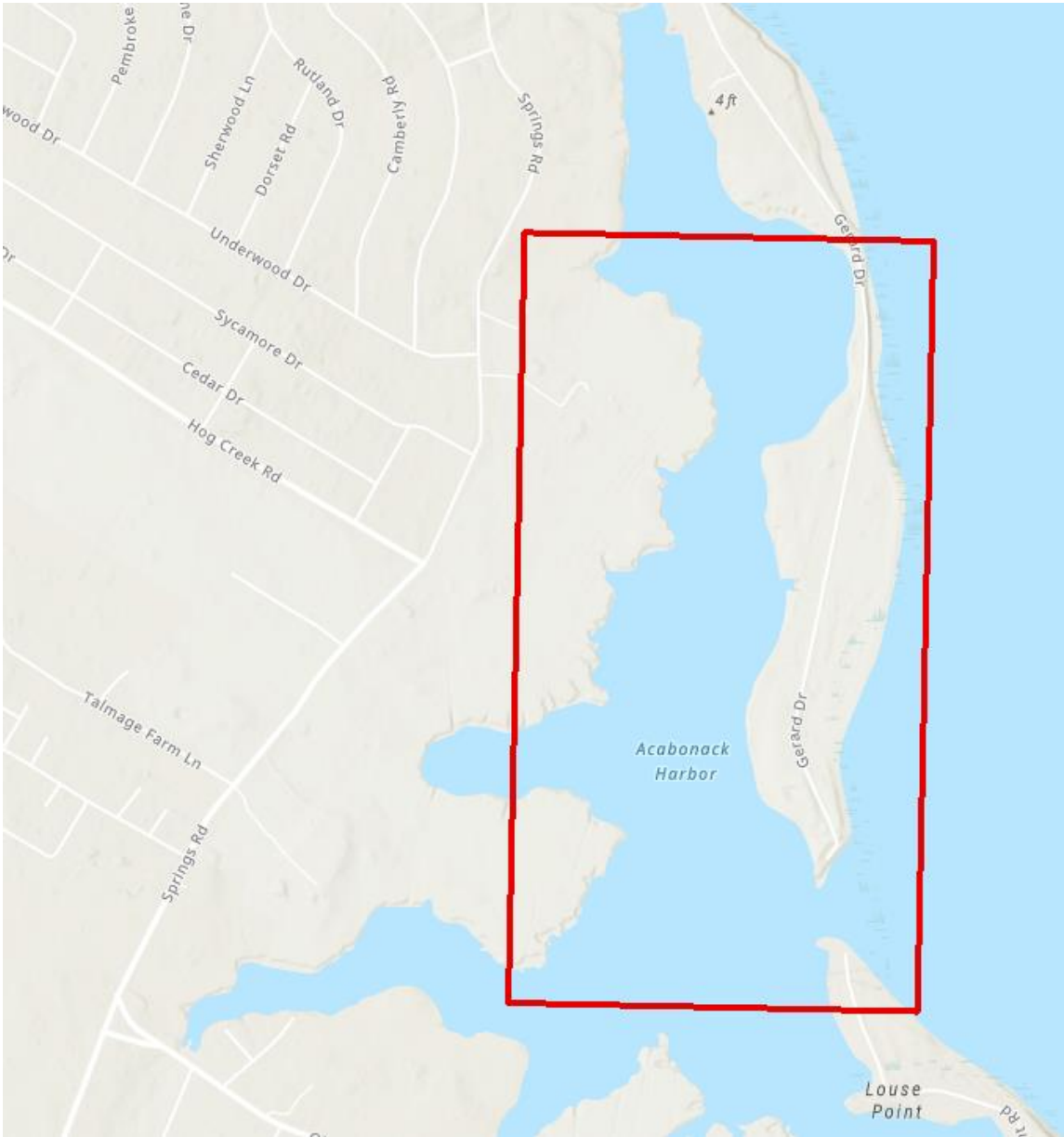


# East Hampton Term Shoreline Change



Gerard Drive/Louse Point

# Focus Area: Gerard Drive/Louse Point





# Focus Area: Gerard Drive



- A** ECOLOGICALLY VALUABLE MARSHLANDS
- B** PENINSULA SHELTERS INLAND NEIGHBORHOODS FROM STORMS

- C** NATURE PRESERVE AREAS
- D** SCENIC BEACHES
- E** LOW-LYING SINGLE ACCESS ROAD

Gerard Drive, c. 2020

KEY  
ASSETS



# Focus Area: Louse Point



Louse Point, c. 2020

KEY  
ASSETS

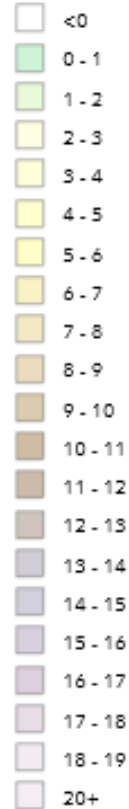
- A** ECOLOGICALLY VALUABLE WOOD TICK, EDWARDS ISLAND, MERRILL LAKE SANCTUARY
- B** RECREATIONAL BOATING FACILITIES
- C** LOUSE POINT BEACH
- D** LOUSE POINT ROAD
- E** HOMES



# Focus Area: Gerard Drive/Louse Point

## Topography

NOAA CoNED Topography (ft)



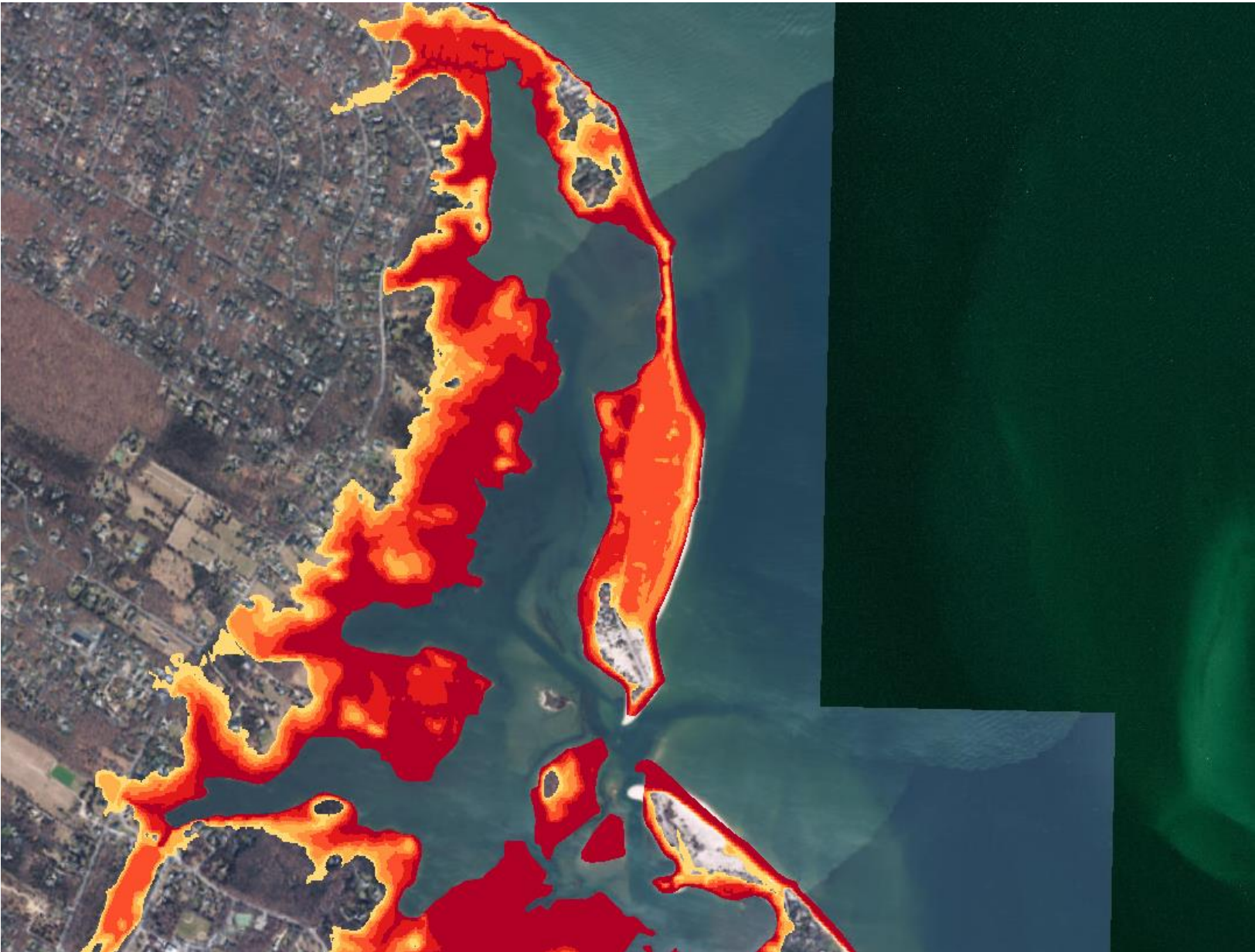
# Focus Area: Gerard Drive/Louse Point

## Tidal Flooding

Sea Level Rise Scenarios

- 1 ft above current MHHW
- 2 ft above current MHHW
- 3 ft above current MHHW
- 4 ft above current MHHW
- 5 ft above current MHHW
- 6 ft above current MHHW
- // Areas not mapped

1 foot (MHHW = 2 feet NAVD88):	Year 2040
2 feet (MHHW = 3 feet NAVD88):	Years 2060 to 2065
3 feet (MHHW = 4 feet NAVD88):	Year 2080
4 feet (MHHW = 5 feet NAVD88):	Year 2100





# Focus Area: Gerard Drive/Louse Point

Extreme Flooding:

✓ FEMA Base Flood

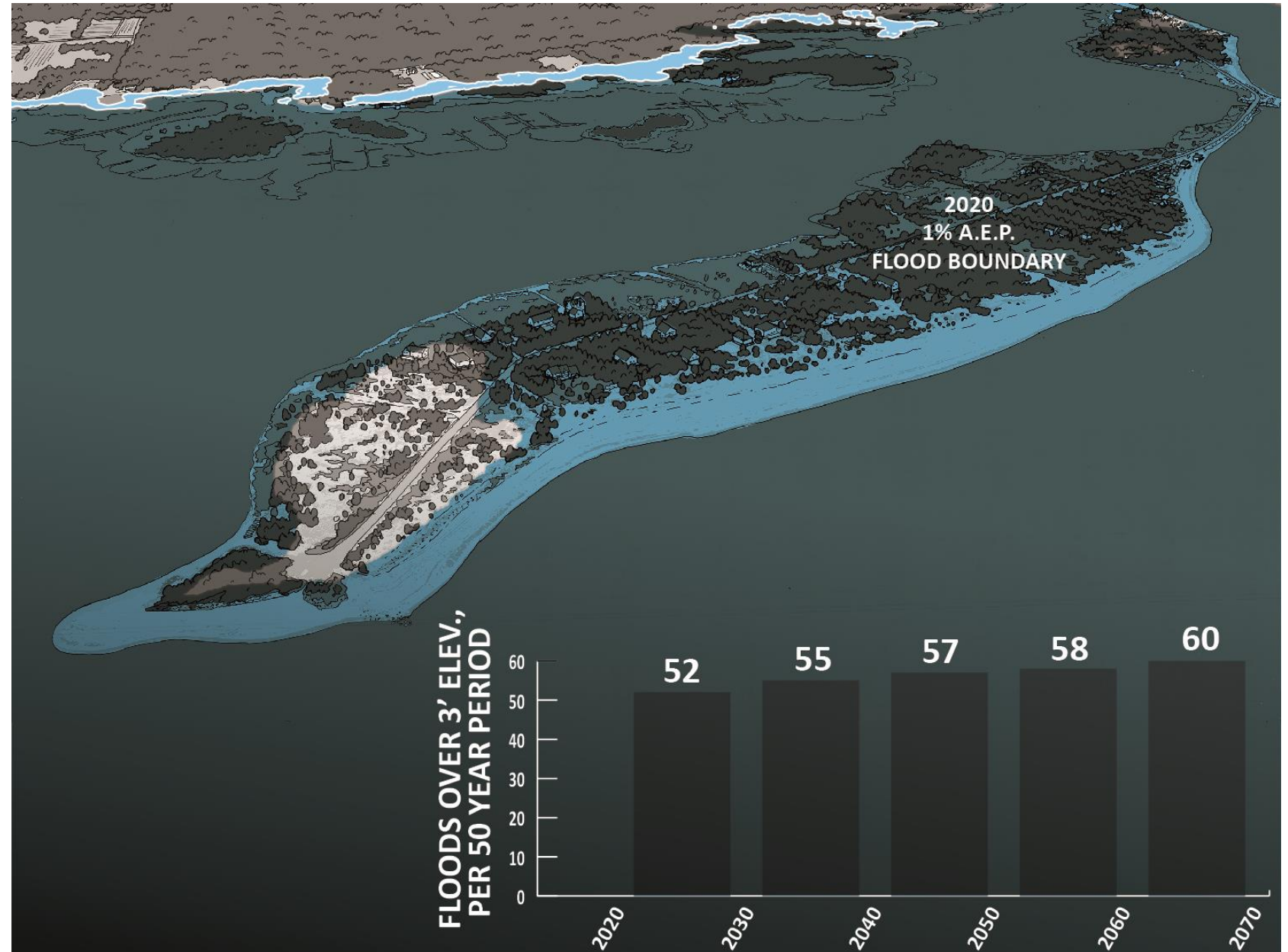




# Focus Area: Gerard Drive/Louse Point

## Extreme Flooding:

- ✓ Future Flood Events  
(>El. 3 feet NAVD88)



# Focus Area: Gerard Drive

## Shoreline Change:

✓ Retreating



**A** SAND TRANSPORT DIRECTION

**B** PENINSULA NATURALLY  
MIGRATING INLAND AS SEA LEVELS RISE

**C** MARSHES NATURALLY  
MIGRATING INLAND  
AS SEA LEVELS RISE

COASTAL  
PROCESSES



# Focus Area: Louse Point

## Shoreline Change:

✓ Retreating



**A** SAND TRANSPORT DIRECTION

**C** MARSHES NATURALLY MIGRATING INLAND AS SEA LEVELS RISE

**B** PENINSULA NATURALLY MIGRATING INLAND AS SEA LEVELS RISE

**D** COASTAL EROSION STRUCTURES INTERRUPT SAND TRANSPORT

COASTAL  
PROCESSES



# Focus Area: Gerard Drive/Louse Point

## Shoreline Change:

- ✓ Retreating
- ✓ Avg – 0.3 ft/yr, Max -6.4 ft/yr





# Focus Area: Gerard Drive



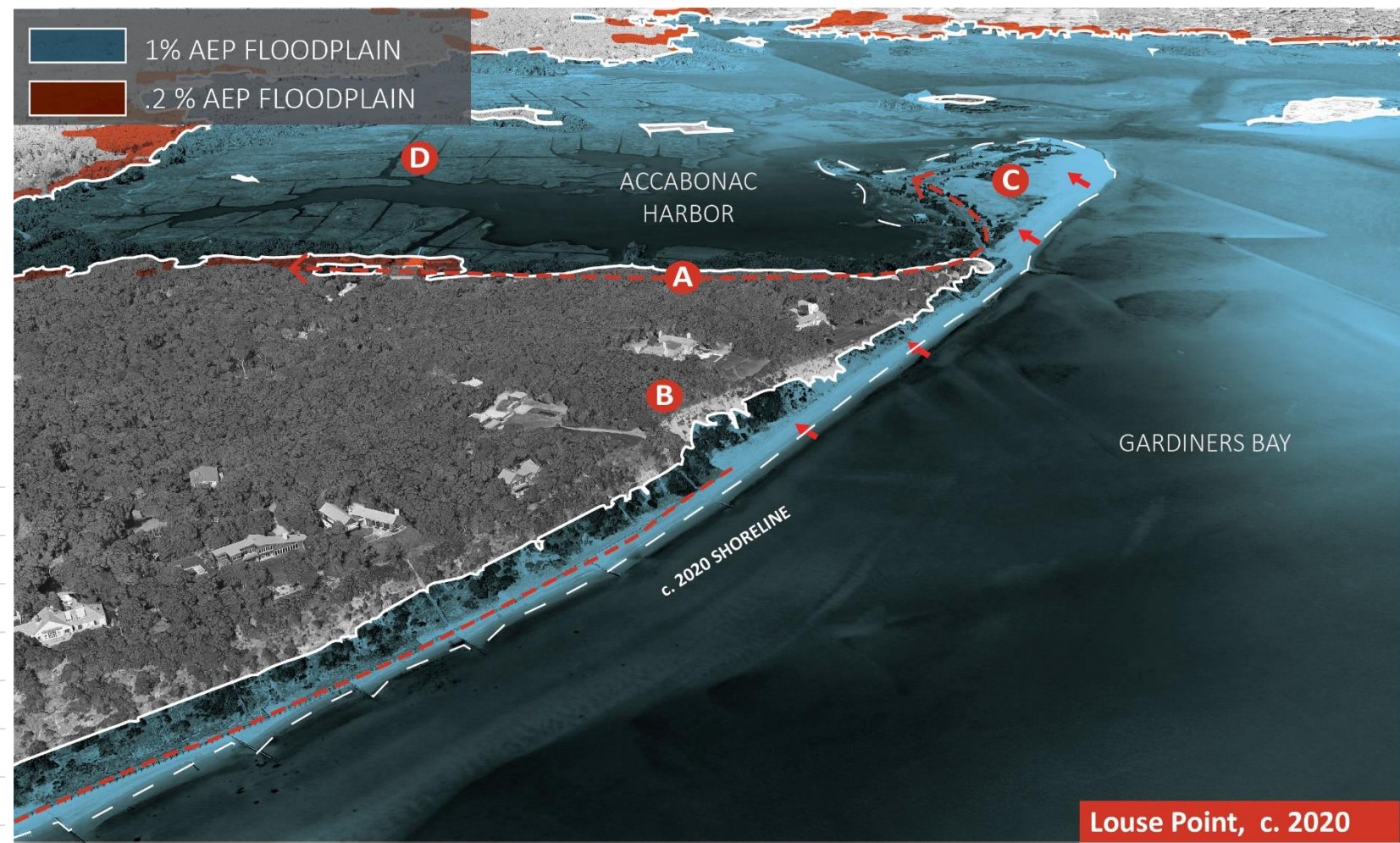
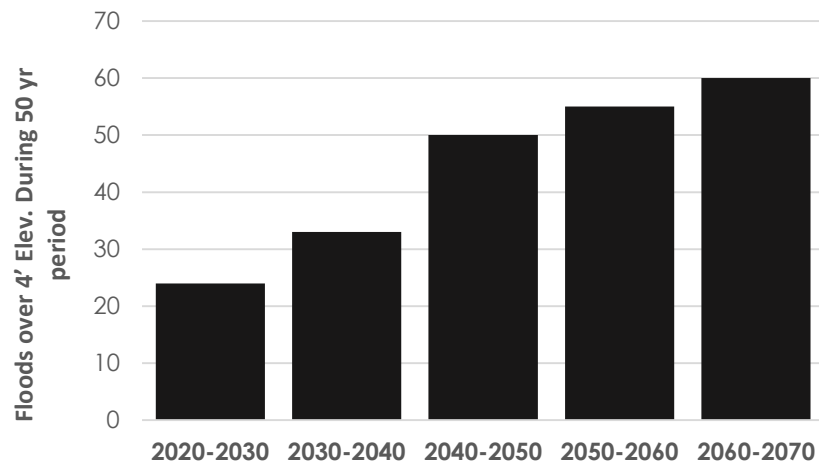
- A** HOMES ON PENINSULA VULNERABLE TO SHORELINE RETREAT
- B** ALMOST ALL HOMES WITHIN 1% AEP FLOODPLAIN.
- C** SEPTIC SYSTEM IMPACTS
- D** SPRINGS FIREPLACE ROAD HOMES WITHIN .2% AEP FLOODPLAIN
- E** ACCESS ROAD VULNERABLE TO FLOODING

Gerard Drive, c. 2020

**EXISTING VULNERABILITY**



# Focus Area: Louse Point

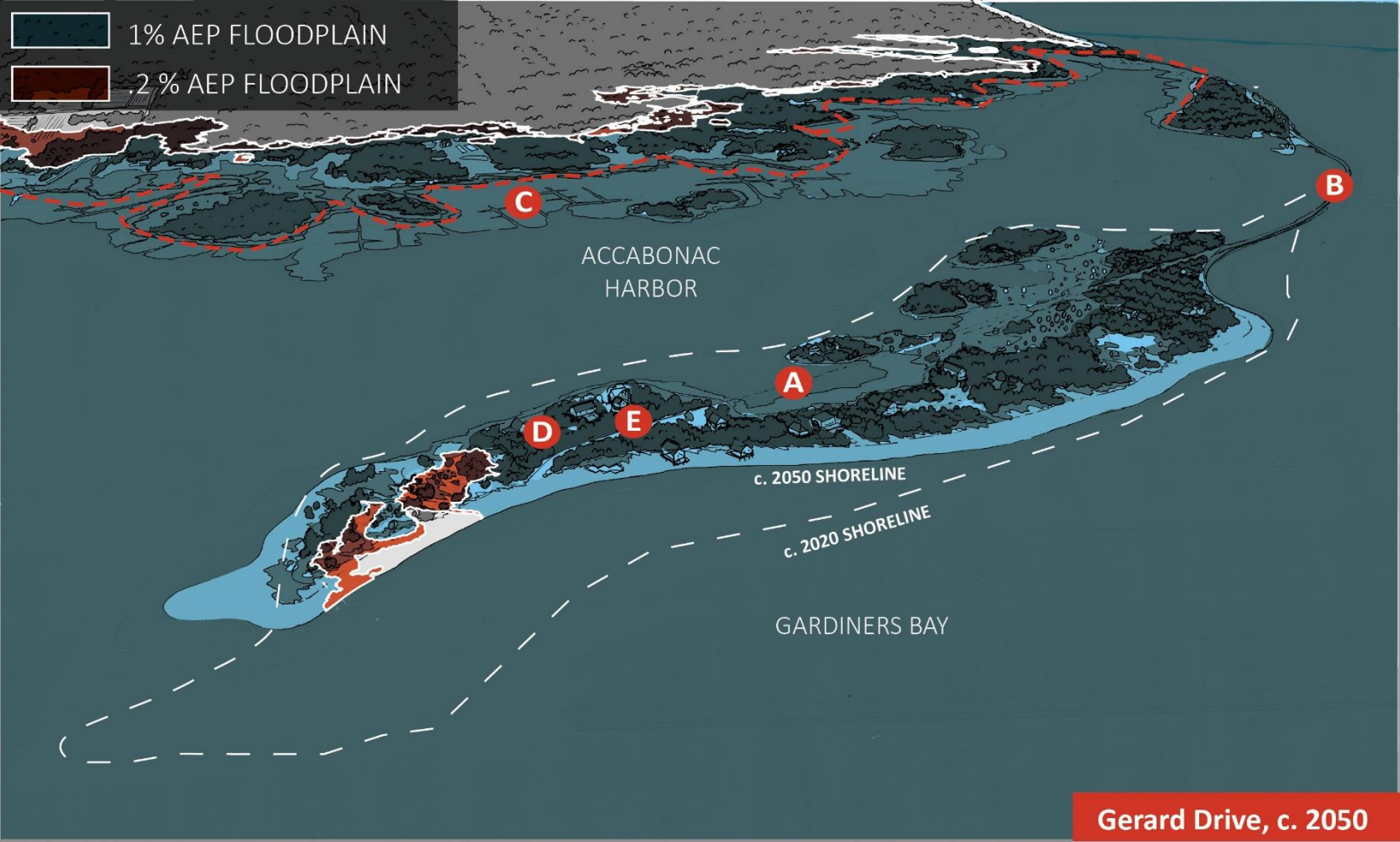


- A** LOUSE ROAD VULNERABLE TO FLOODING
- B** PROPERTIES VULNERABLE TO COASTAL EROSION
- C** RECREATION SITES VULNERABLE TO FLOODING
- D** ACCABONAC HARBOR VULNERABLE TO WETLAND CONVERSION & LOSS

Louse Point, c. 2020

EXISTING  
VULNERABILITY

# Focus Area: Gerard Drive



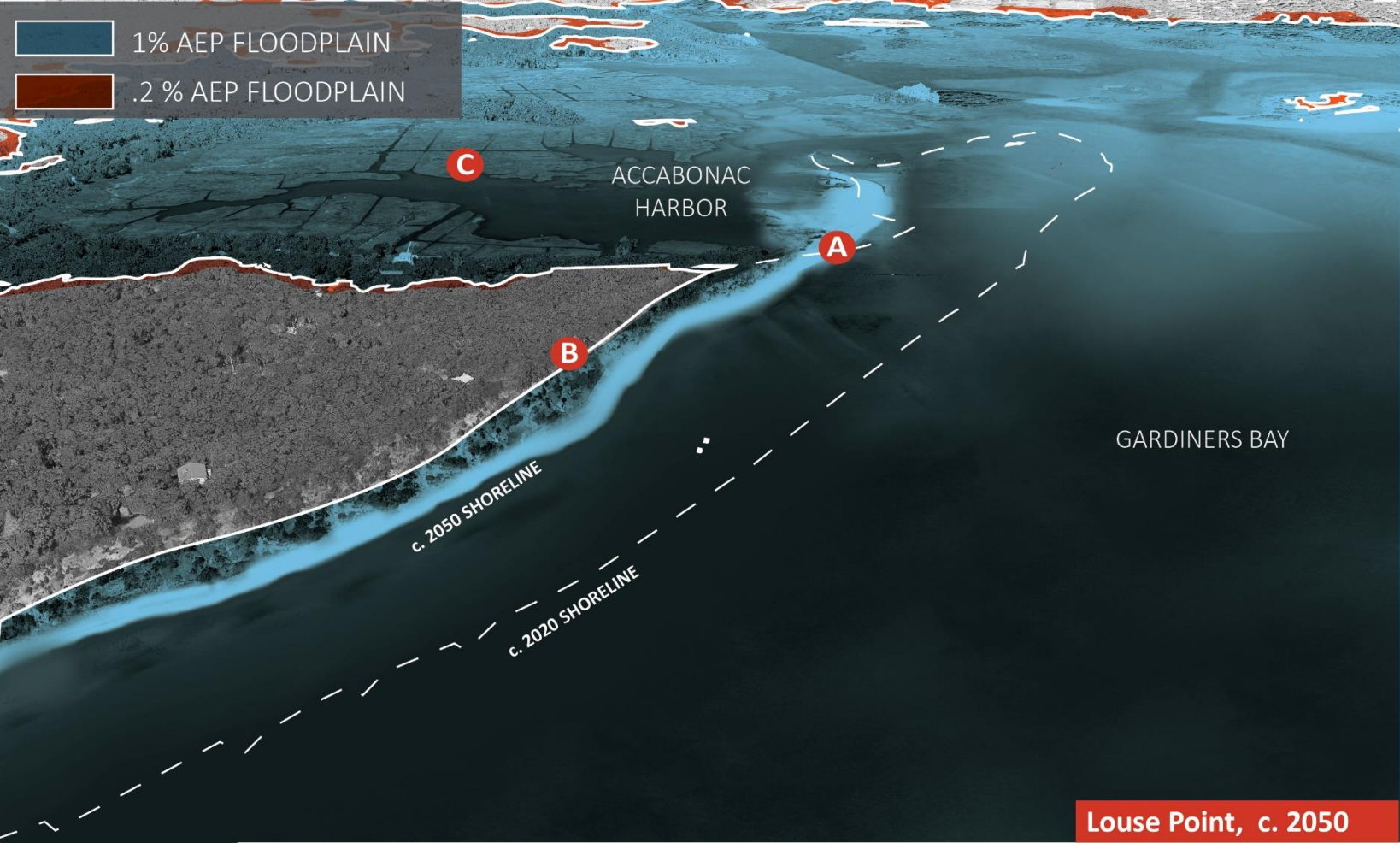
Gerard Drive, c. 2050

- A** PENINSULA LAND MASS SIGNIFICANTLY REDUCED
- B** SOLE ACCESS ROAD TO PENINSULA MORE FREQUENTLY FLOODED & POTENTIALLY LOST TO EROSION
- C** POTENTIAL FOR MARSH AREA LOSS, CONVERSION TO OPEN WATER
- D** TIDAL FLOODING
- E** EMERGENCY RESPONSE INCREASINGLY DIFFICULT

**FUTURE  
VULNERABILITY**



# Focus Area: Louse Point





# Focus Area: Gerard Drive/Louse Point

## Strategy:

✓ Accommodate



- |  |   |
|--|---|
| <b>A</b> BEACH MANAGEMENT, CONSTRUCTED DUNES             | <b>D</b> STRICT ENFORCEMENT OF COASTAL EROSION ZONES & SETBACKS |
| <b>B</b> ELEVATE BUILDINGS & SEPTIC                      | <b>E</b> EVACUATION /EMERGENCY PLANS                            |
| <b>C</b> LIMIT RECONSTRUCTION OF STORM-DAMAGED BUILDINGS | <b>F</b> EXPAND GERARD DRIVE REVETMENT                          |
|  | <b>G</b> LIVING SHORELINES                                      |

Gerard Drive, c. 2050

**ACCOMMODATE**



# Focus Area: Gerard Drive/Louse Point

## Strategy:

✓ Managed Retreat



- A** BUYOUT/ACQUISITION
- B** REMOVE COASTAL EROSION STRUCTURES
- C** REMOVE ROADWAY WHEN IMPASSABLE

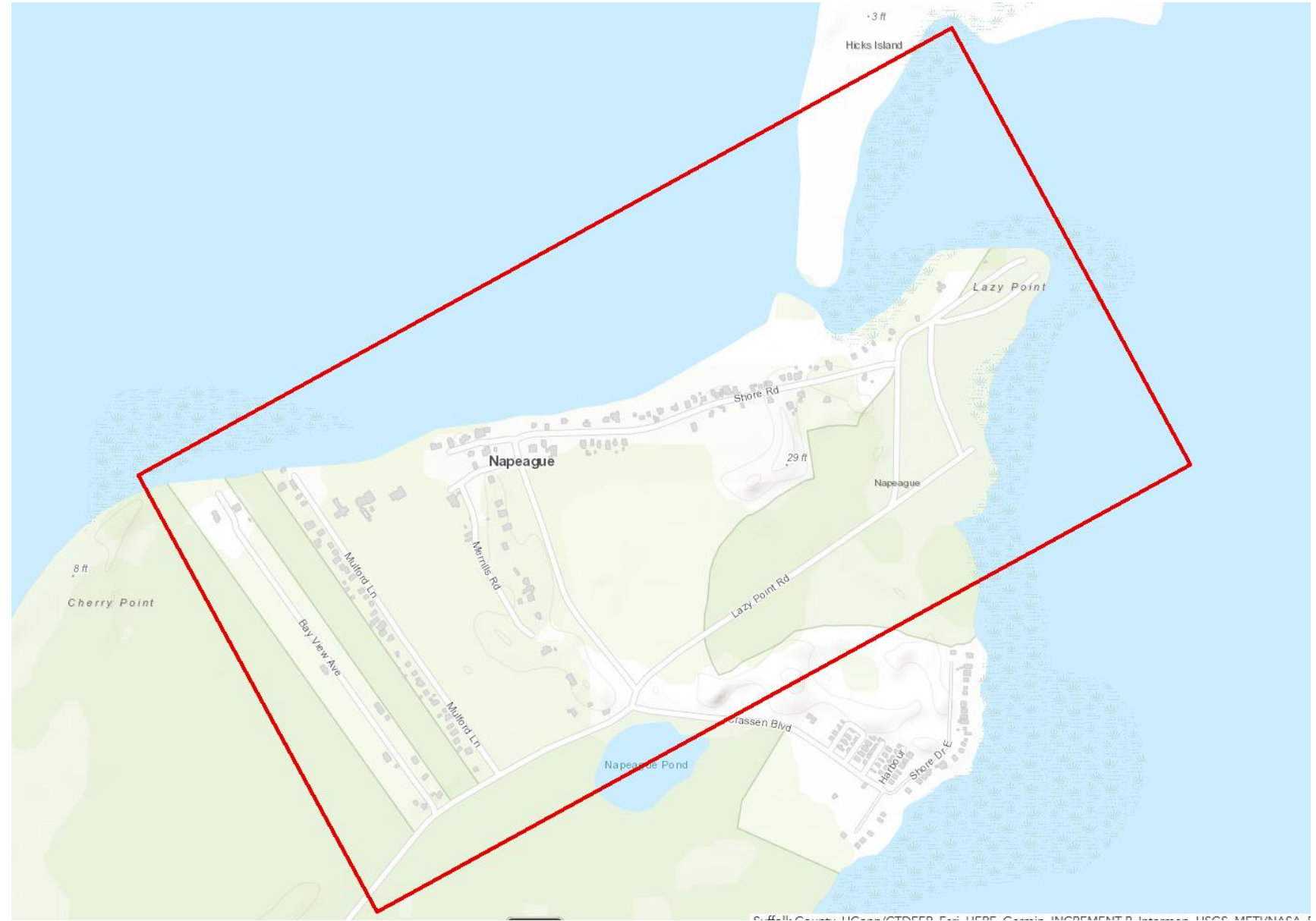
- D** INCREASE COASTAL SETBACKS
- E** LIMIT RECONSTRUCTION OF STORM DAMAGED HOMES
- F** EVACUATION PLAN FOR REMAINING ROADWAYS

Gerard Drive, c. 2050

**MANAGED  
RETREAT**

# Lazy Point/Napeague

# Focus Area: Lazy Point/Napeague





# Focus Area: Lazy Point/Napeague



Lazy Point, c. 2020

- A** NAPEAGUE HARBOR
- B** BEACHES AND DUNES
- C** TRUSTEE OWNED LAND
- D** NAPEAGUE STATE PARK

- E** SHORE RD RESIDENCES LEASED FROM TRUSTEES
- F** PINE SCRUB
- G** MARSHES AND WETLANDS

**KEY  
ASSETS**

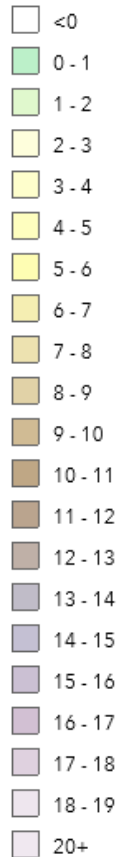


# Focus Area: Lazy Point/Napeague

## Topography

✓ NOAA Elevation

✓ NOAA CoNED Topography (ft)





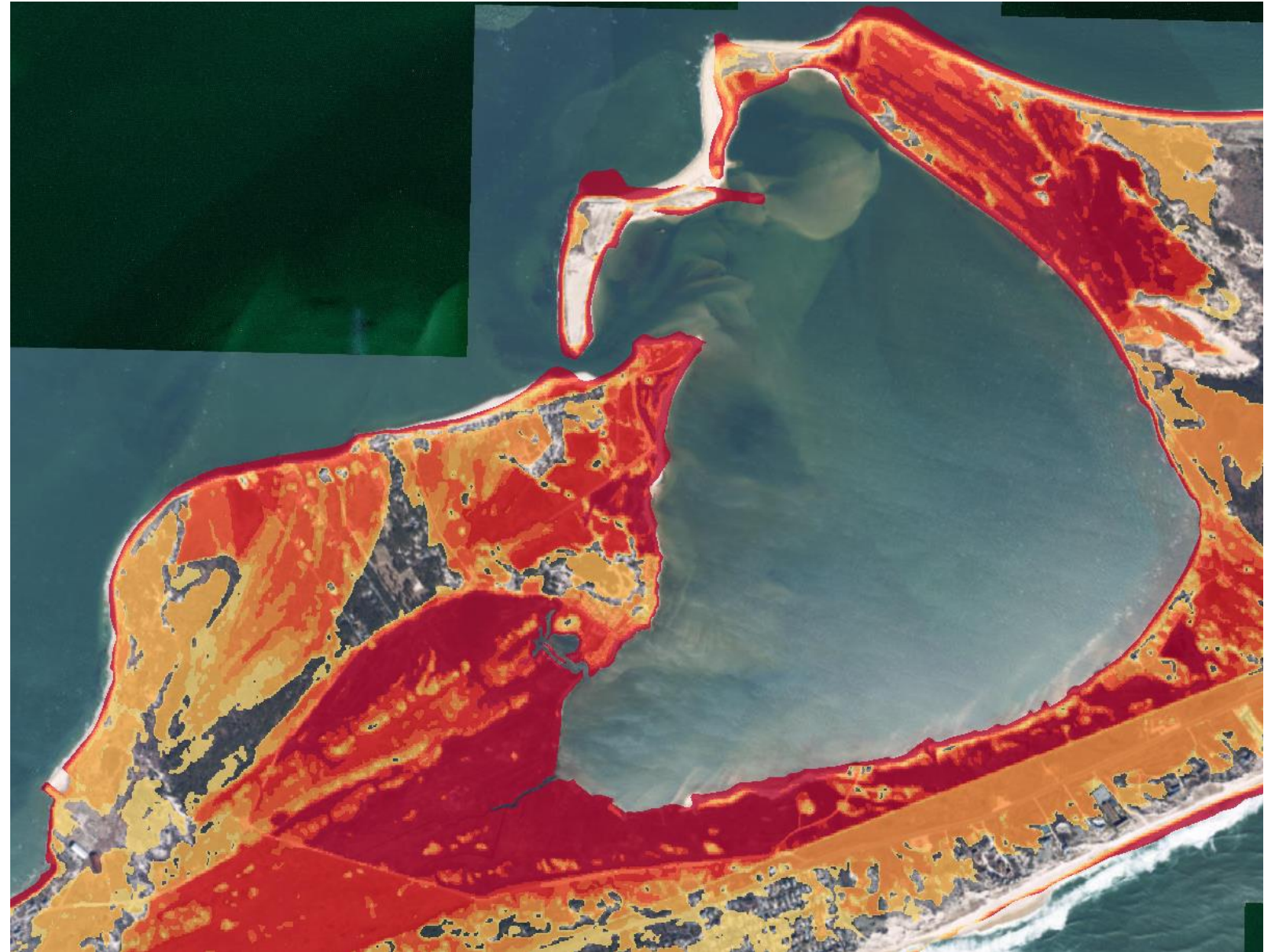
# Focus Area: Lazy Point/Napeague

## Tidal Flooding

### Sea Level Rise Scenarios

- 1 ft above current MHHW
- 2 ft above current MHHW
- 3 ft above current MHHW
- 4 ft above current MHHW
- 5 ft above current MHHW
- 6 ft above current MHHW
- // Areas not mapped

1 foot (MHHW = 2 feet NAVD88):	Year 2040
2 feet (MHHW = 3 feet NAVD88):	Years 2060 to 2065
3 feet (MHHW = 4 feet NAVD88):	Year 2080
4 feet (MHHW = 5 feet NAVD88):	Year 2100





# Focus Area: Lazy Point/Napeague

Extreme Flooding:

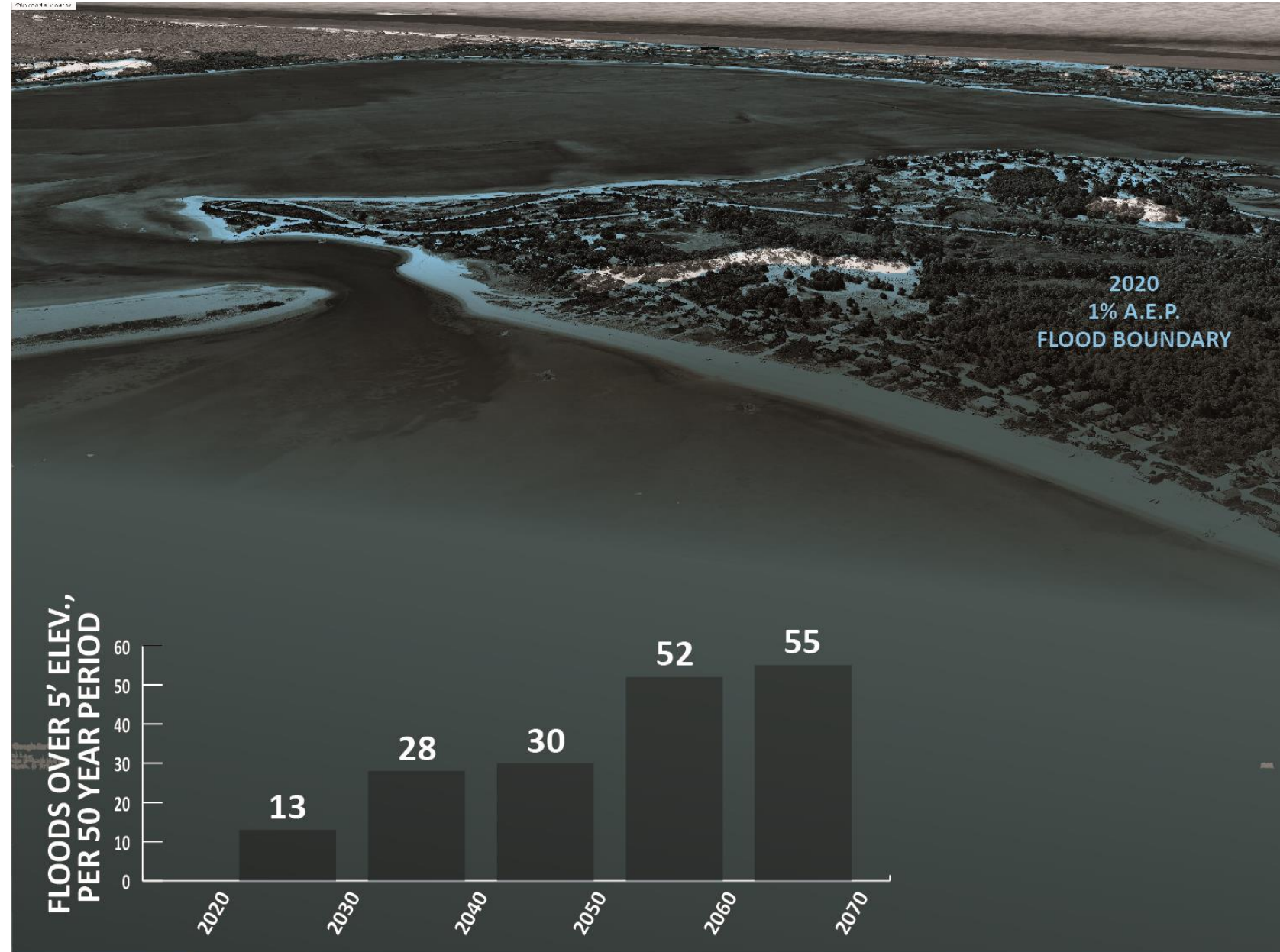
✓ FEMA Base Flood



# Focus Area: Lazy Point/Napeague

## Extreme Flooding:

- ✓ Future Flood Events  
(>El. 5 feet NAVD88)





# Focus Area: Lazy Point/Napeague

## Shoreline Change:

✓ Retreating



Lazy Point, c. 2020

**A** SAND TRANSPORT DIRECTION

**B** SHORELINE RETREATING

**C** MARSHES NATURALLY  
MIGRATE INLAND  
AS SEA LEVELS RISE

COASTAL  
PROCESSES



# Focus Area: Lazy Point/Napeague

## Shoreline Change:

- ✓ Retreating
- ✓ Avg: -1.6 ft/yr, Max: -4.4 ft/yr





# Focus Area: Lazy Point/Napeague



- A** ALMOST ALL HOMES AND ROADS WITHIN 1% AEP FLOODPLAIN
- B** SHORE RD VULNERABLE TO STORM DAMAGE

- C** HOMES VULNERABLE TO RETREATING SHORELINE
- D** HOMES VULNERABLE TO WAVE DAMAGE IN STORMS

Lazy Point, c. 2020

**EXISTING  
VULNERABILITY**



# Focus Area: Lazy Point/Napeague



- A SHORE RD VULNERABLE TO LOSS FROM SHORELINE EROSION
- B MORE FREQUENT FLOODING IN STORMS
- C TIDAL FLOODING
- D INCREASED GROUNDWATER ELEVATIONS INTERFERE WITH SEPTIC SYSTEMS

# Focus Area: Lazy Point/Napeague

## Strategy:

✓ Accommodate



**A** RAISE HOUSES AND MOUND SEPTIC SYSTEMS, WHERE FEASIBLE

**B** ELEVATE ROADWAYS

**C** BEACH MANAGEMENT / NOURISHMENT

Lazy Point

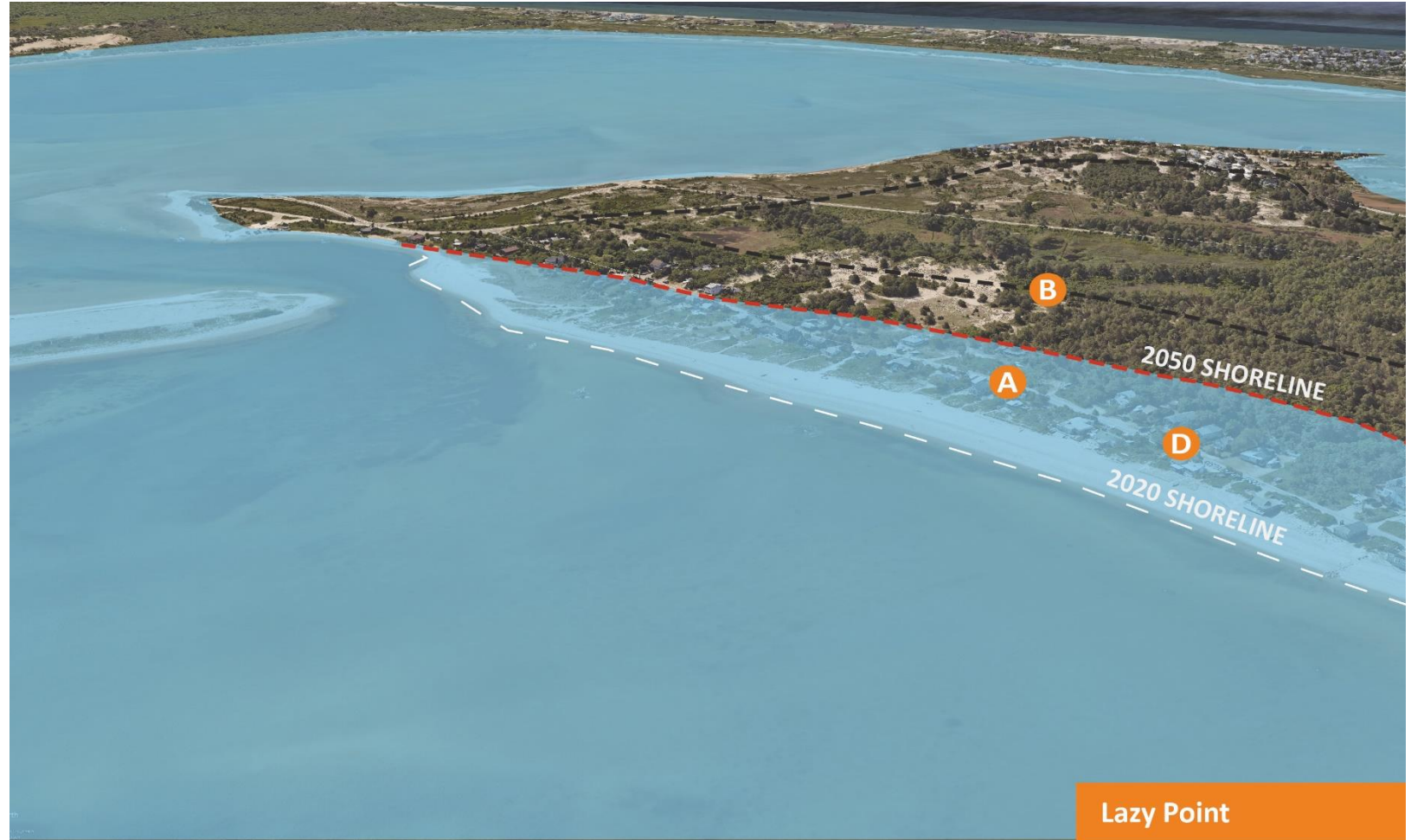
**ACCOMMODATE  
STRATEGY**



# Focus Area: Lazy Point/Napeague

## Strategy:

✓ Managed Retreat



- A** LONG TERM: NO LEASE RENEWAL;  
BUILDING / SEPTIC REMOVAL
- B** INCREASE COASTAL SETBACKS
- C** STRICT ENFORCEMENT OF COASTAL  
SETBACKS AND COASTAL EROSION  
ZONES
- D** REMOVE ROADWAYS

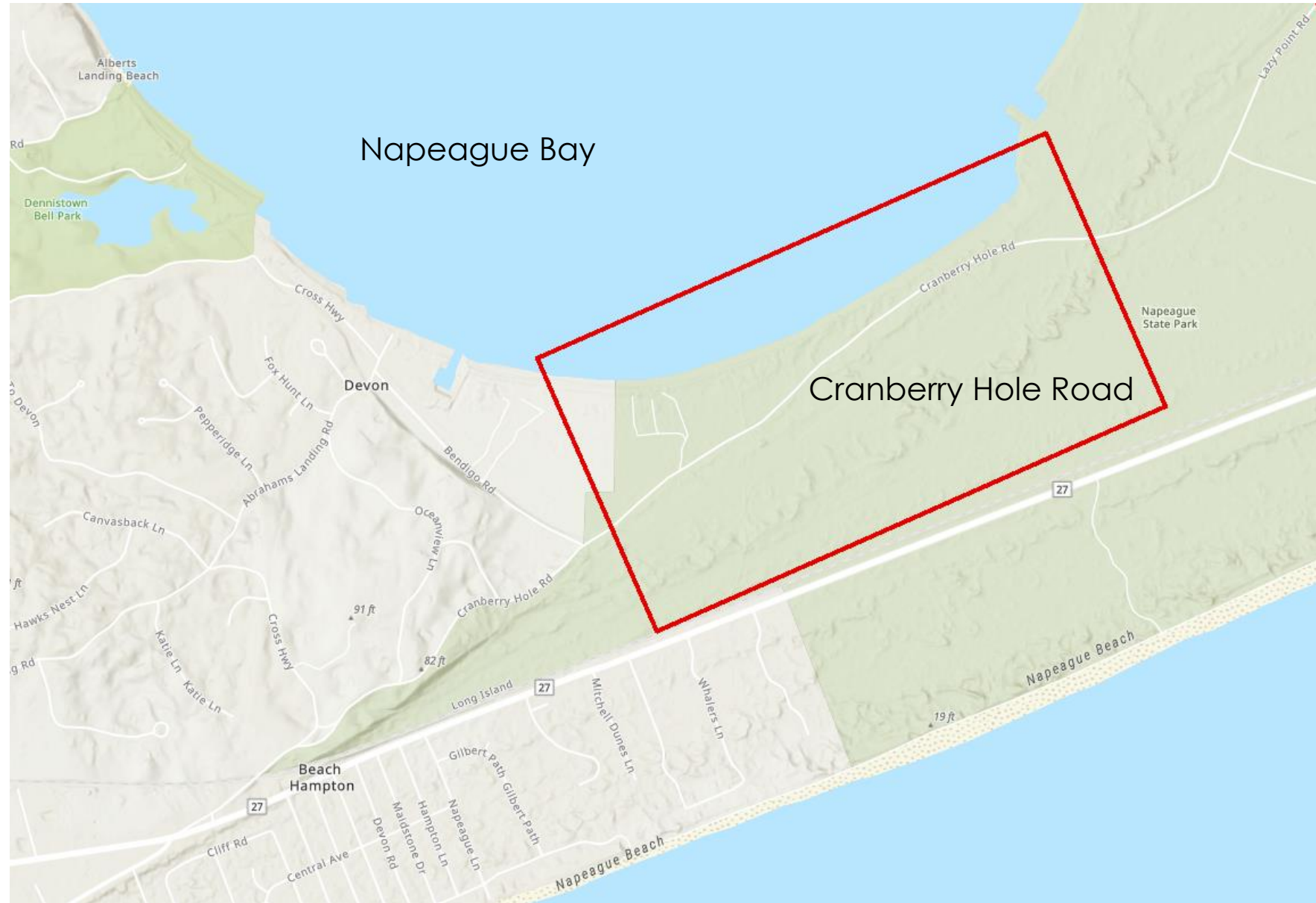
Lazy Point

**RETREAT  
STRATEGY**

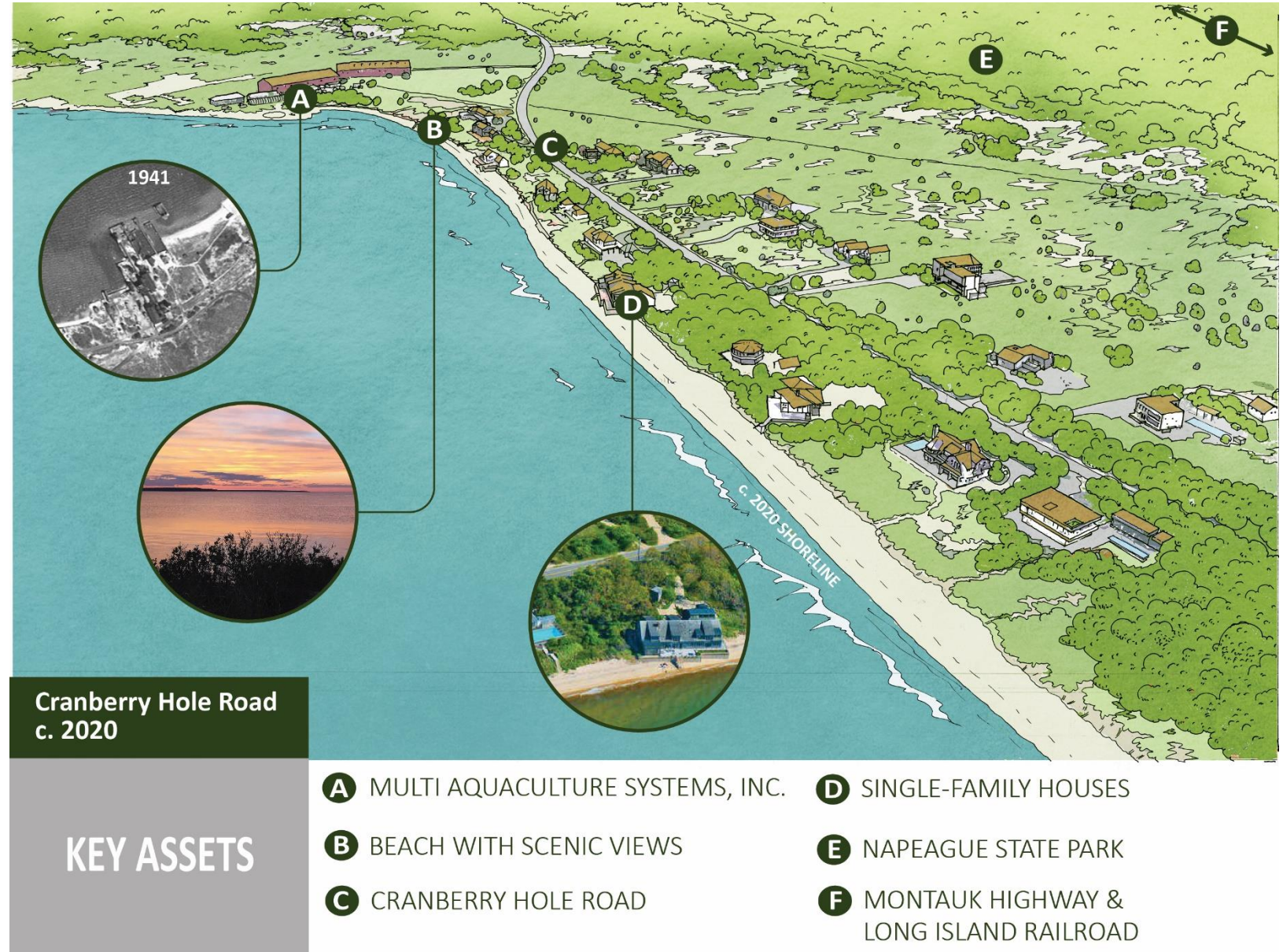
# Cranberry Hole Road



# Focus Area: Cranberry Hole Road



# Focus Area: Cranberry Hole Road





# Focus Area: Cranberry Hole Road

## Key Assets





# Focus Area: Cranberry Hole Road

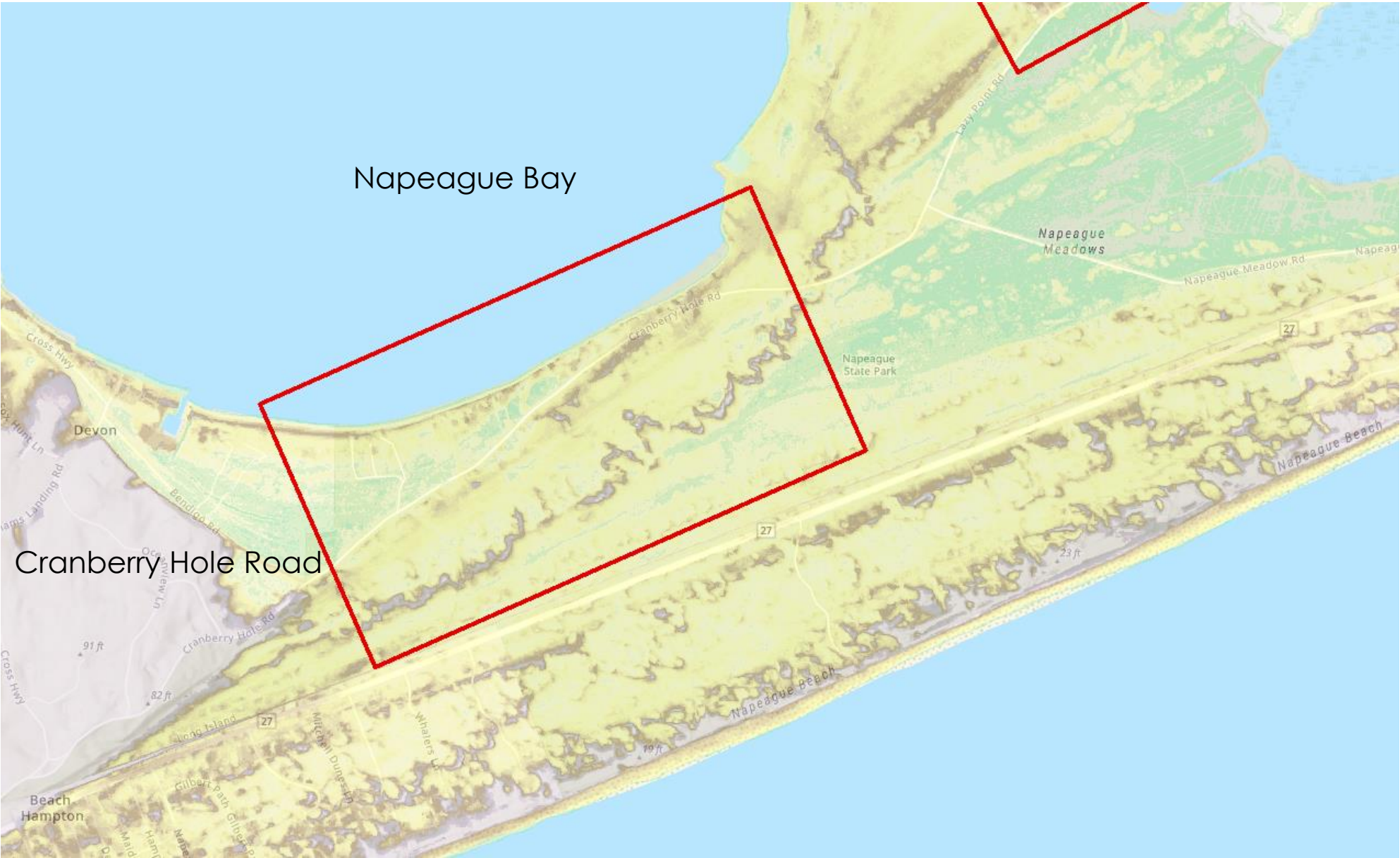
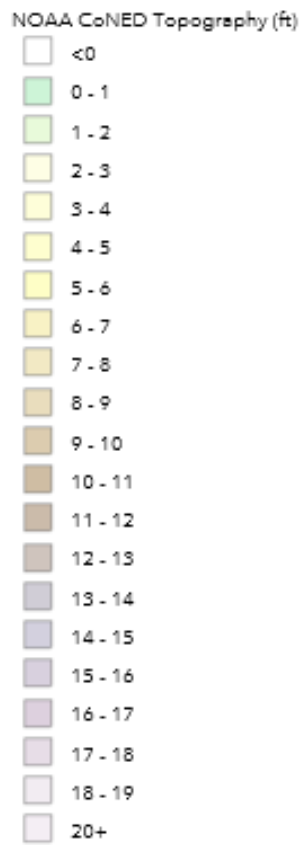
## Key Assets





# Focus Area: Cranberry Hole Road

## Topography



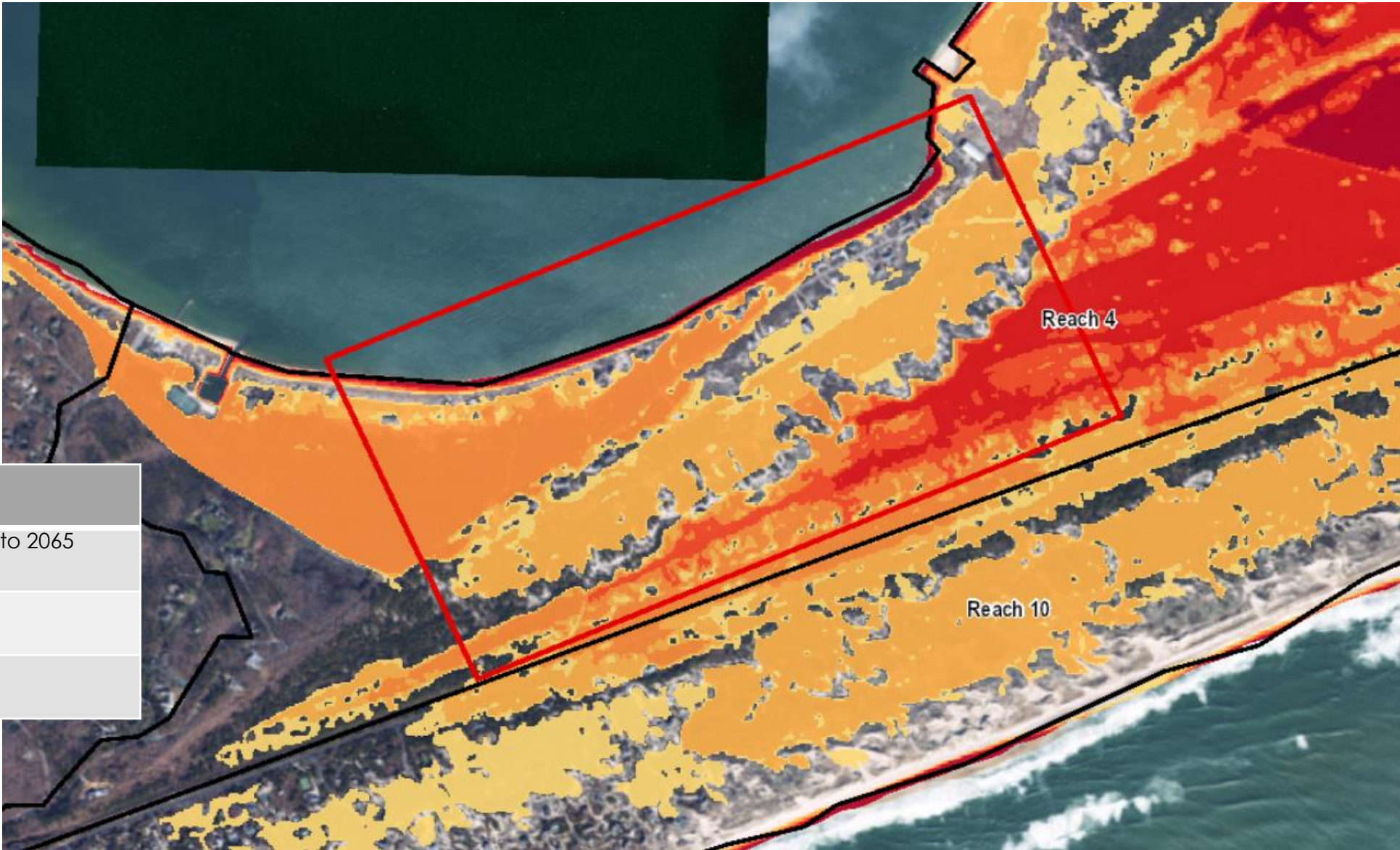


# Focus Area: Cranberry Hole Road

## Tidal Flooding

Sea Level Rise Scenarios

- 1 ft above current MHHW
- 2 ft above current MHHW
- 3 ft above current MHHW
- 4 ft above current MHHW
- 5 ft above current MHHW
- 6 ft above current MHHW
- Areas not mapped



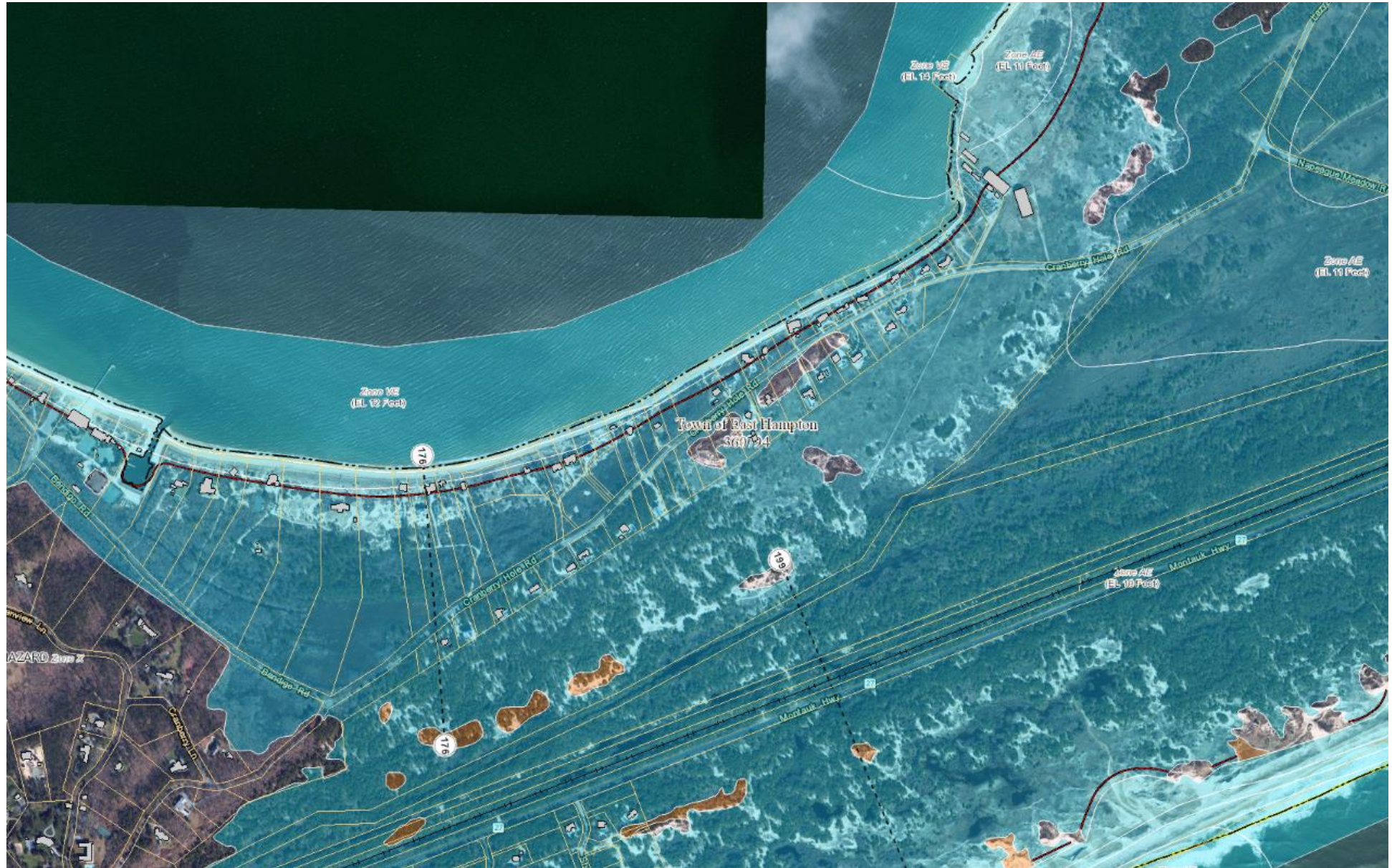
1 foot (MHHW = 2 feet NAVD88):	Year 2040
2 feet (MHHW = 3 feet NAVD88):	Years 2060 to 2065
3 feet (MHHW = 4 feet NAVD88):	Year 2080
4 feet (MHHW = 5 feet NAVD88):	Year 2100



## Focus Area: Cranberry Hole Road

## Extreme Flooding:

✓ FEMA Base Flood

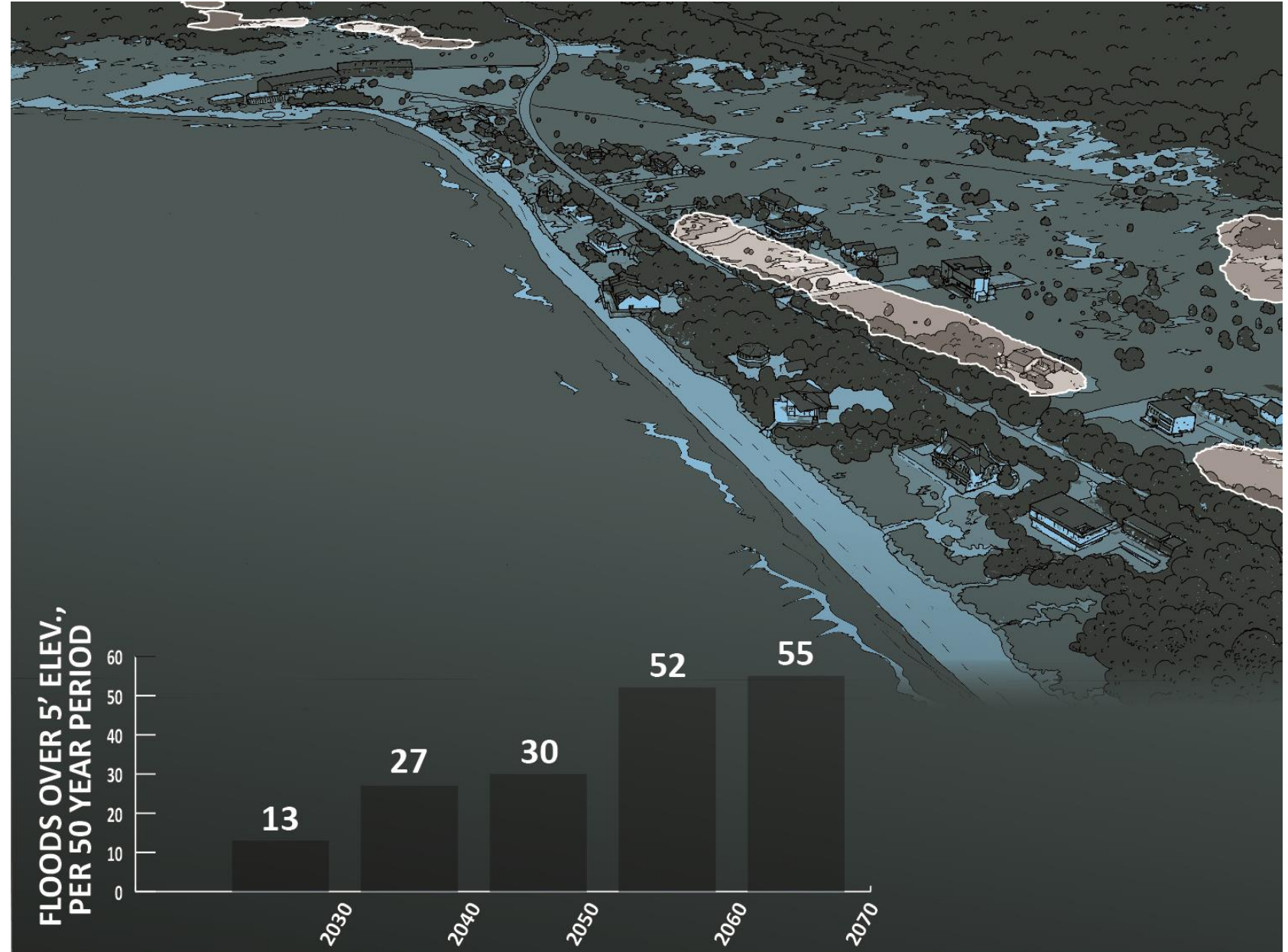




# Focus Area: Cranberry Hole Road

## Extreme Flooding:

- ✓ Future Flood Events  
(>El. 5 feet NAVD88)

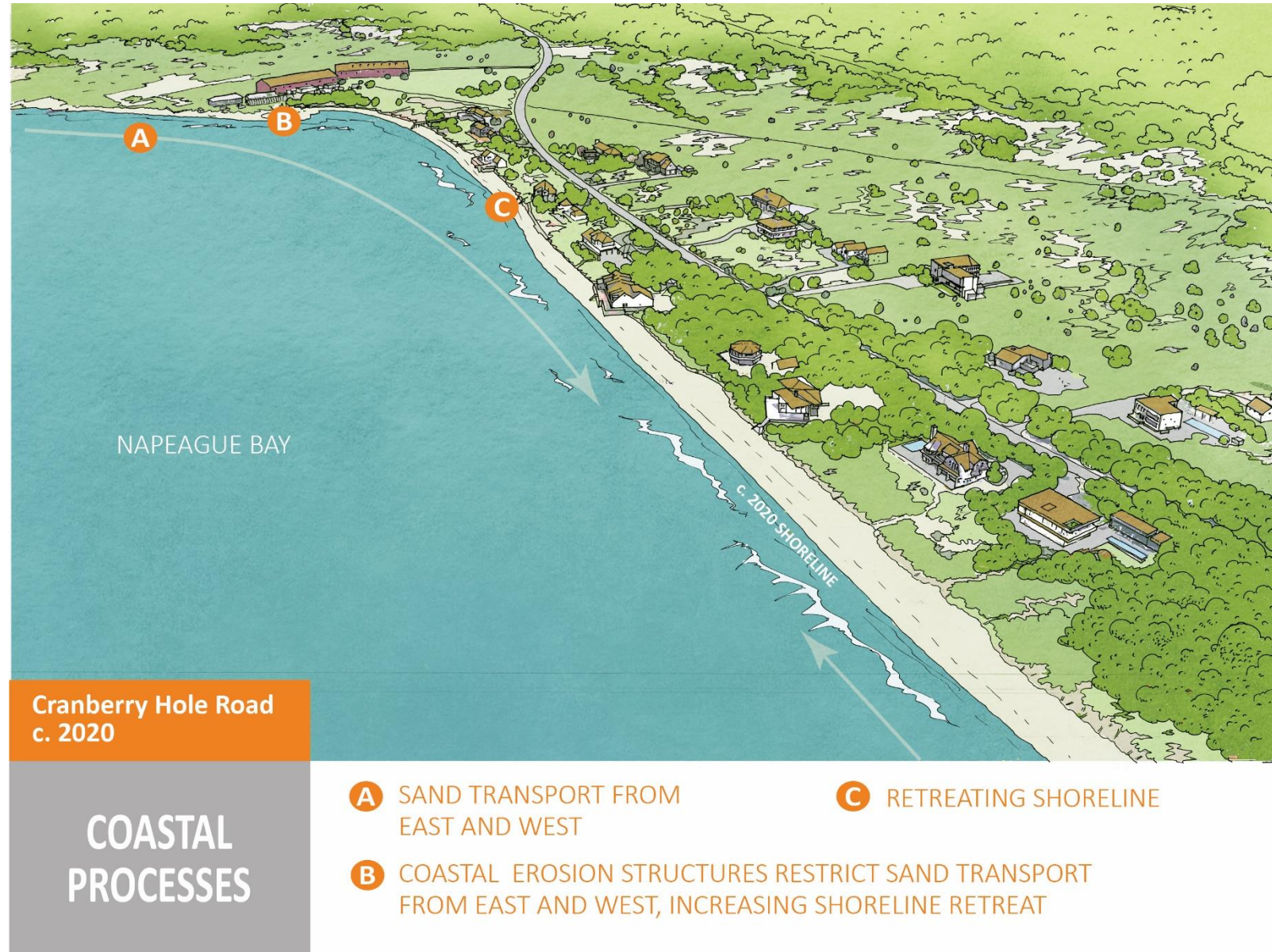




# Focus Area: Cranberry Hole Road

## Shoreline Change:

✓ Retreating





# Focus Area: Cranberry Hole Road

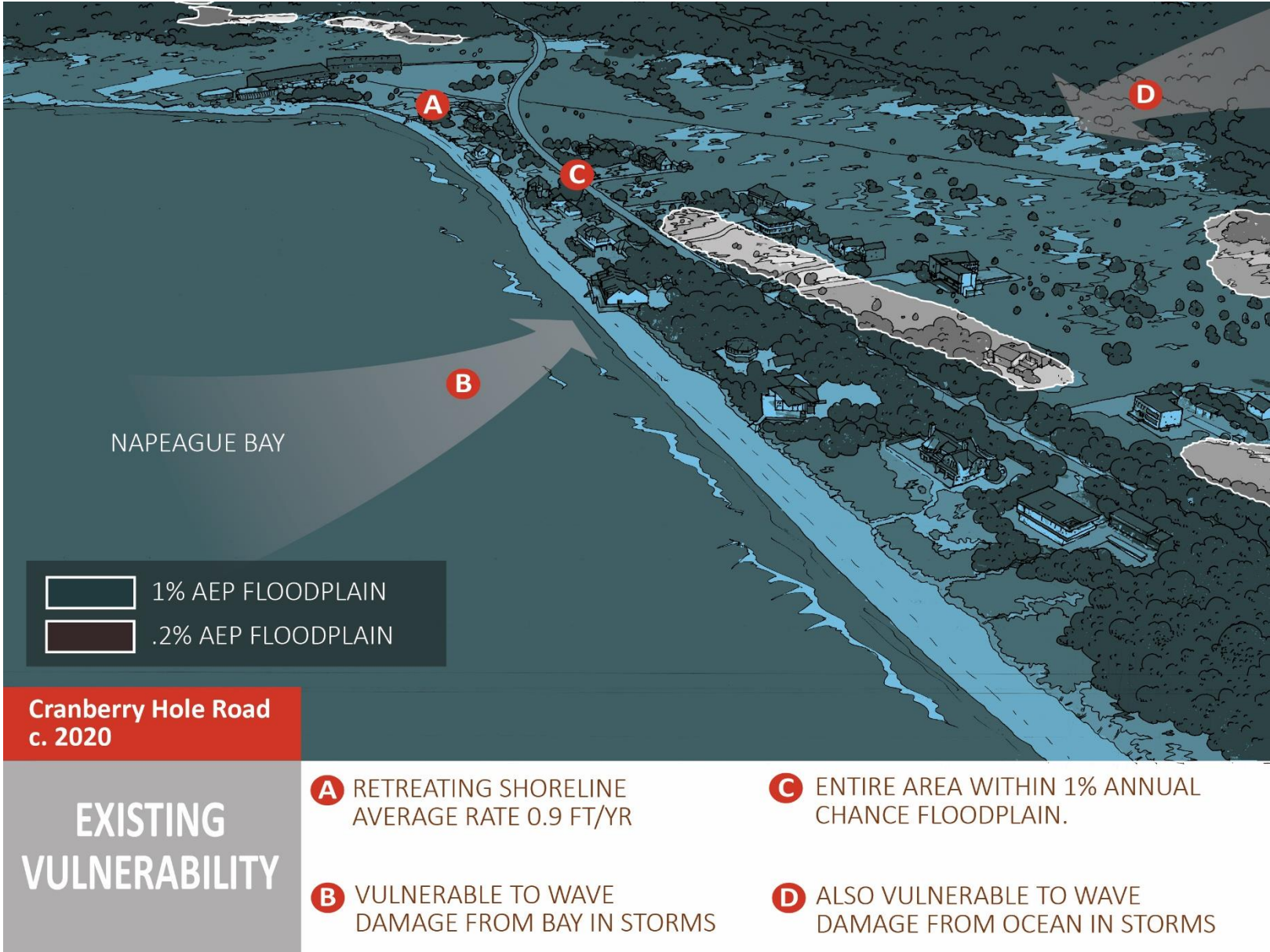
## Shoreline Change:

- ✓ Retreating
- ✓ Avg +/- 1 ft/yr

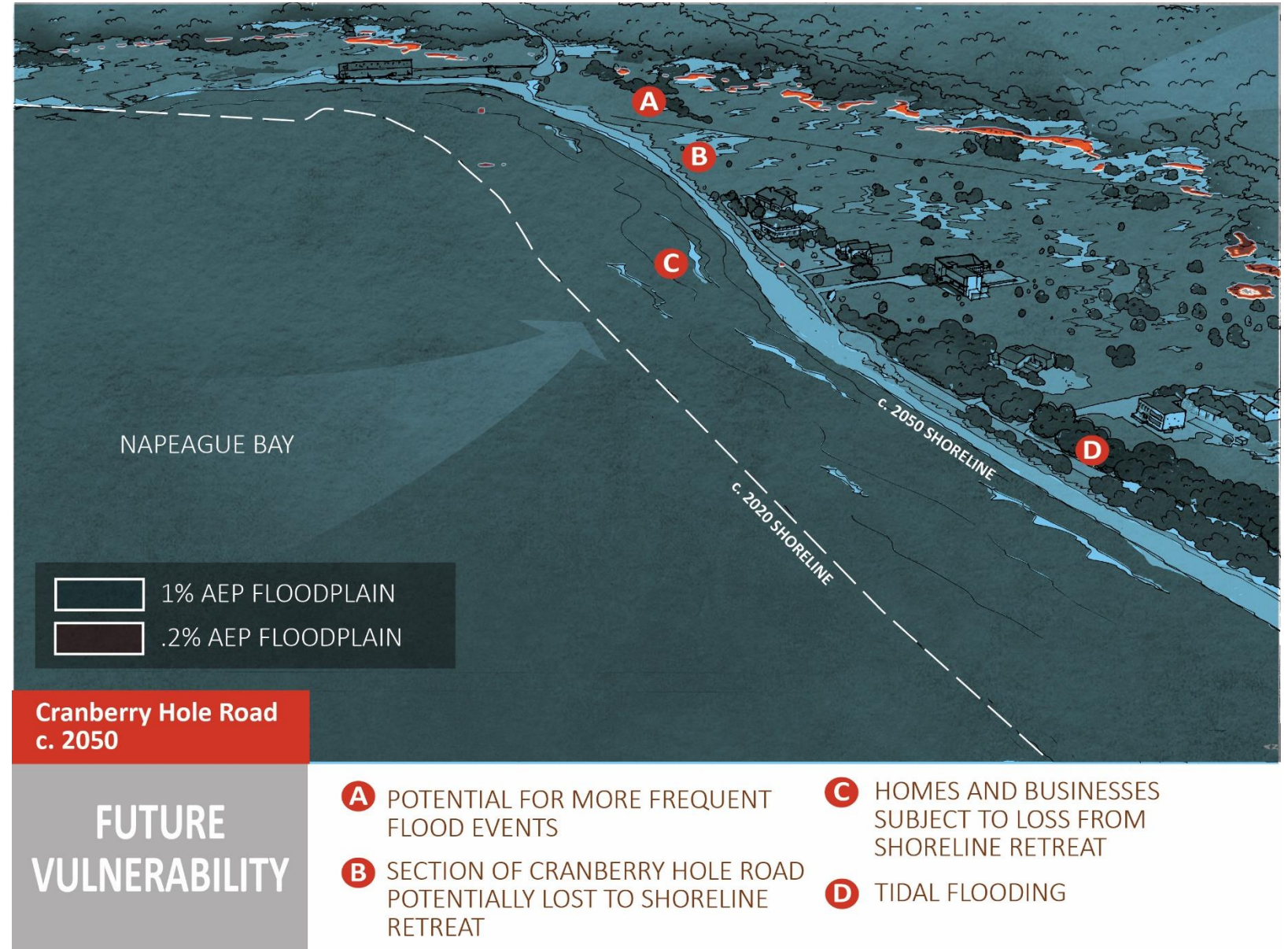




# Focus Area: Cranberry Hole Road



# Focus Area: Cranberry Hole Road





# Focus Area: Cranberry Hole Road

Strategy:

✓ Accommodate



Cranberry Hole Road  
c. 2050

ACCOMMODATE

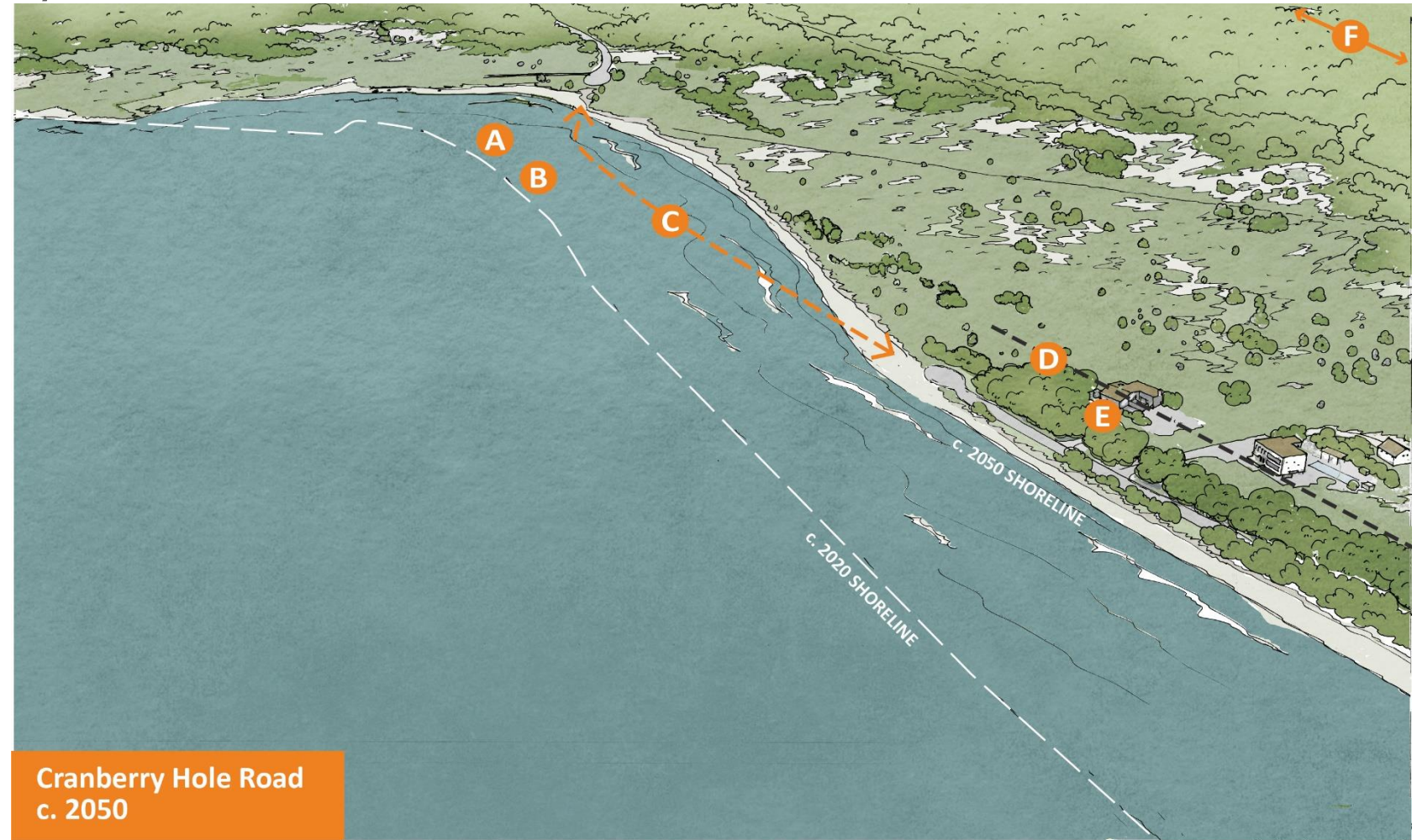
- A** BEACH MANAGEMENT/ NOURISHMENT
- B** ELEVATE BUILDINGS & SEPTIC
- C** LIMIT RECONSTRUCTION OF STORM-DAMAGED BUILDINGS
- D** STRICT ENFORCEMENT OF COASTAL EROSION ZONES & SETBACKS
- E** EVACUATION AND EMERGENCY MGMT PLANS
- F** ELEVATE MONTAUK HIGHWAY



# Focus Area: Cranberry Hole Road

## Strategy:

✓ Managed Retreat



Cranberry Hole Road  
c. 2050

**MANAGED  
RETREAT**

- A** BUYOUT/ACQUISITION
- B** REMOVE COASTAL EROSION STRUCTURES
- C** REMOVE OR RELOCATE ROADWAY SECTION
- D** INCREASE COASTAL SETBACKS
- E** LIMIT RECONSTRUCTION OF STORM DAMAGED HOMES
- F** EVACUATION PLAN FOR REMAINING ROADWAYS



# Coastal Erosion Overlay Zones

# Focus Area: Gerard Drive/Louse Point



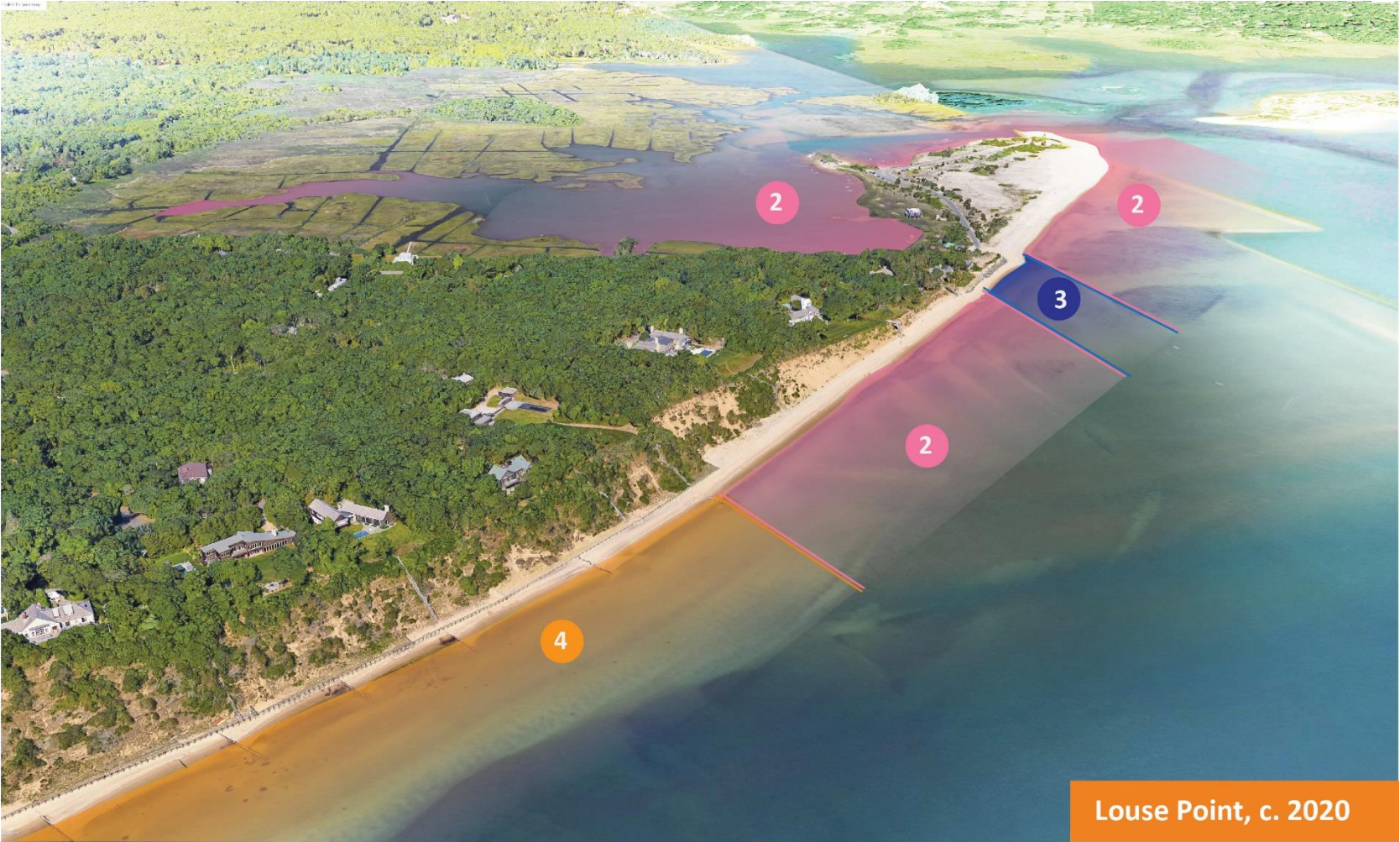
- 1 COASTAL EROSION OVERLAY ZONE 1
- 2 COASTAL EROSION OVERLAY ZONE 2
- 3 COASTAL EROSION OVERLAY ZONE 3
- 4 COASTAL EROSION OVERLAY ZONE 4

Gerard Drive, c. 2020

COASTAL  
EROSION  
OVERLAY  
ZONES



# Focus Area: Gerard Drive/Louse Point



- 1 COASTAL EROSION OVERLAY ZONE 1
- 2 COASTAL EROSION OVERLAY ZONE 2
- 3 COASTAL EROSION OVERLAY ZONE 3
- 4 COASTAL EROSION OVERLAY ZONE 4

Louse Point, c. 2020

**COASTAL  
EROSION  
OVERLAY  
ZONES**



# Focus Area: Lazy Point/Napeague



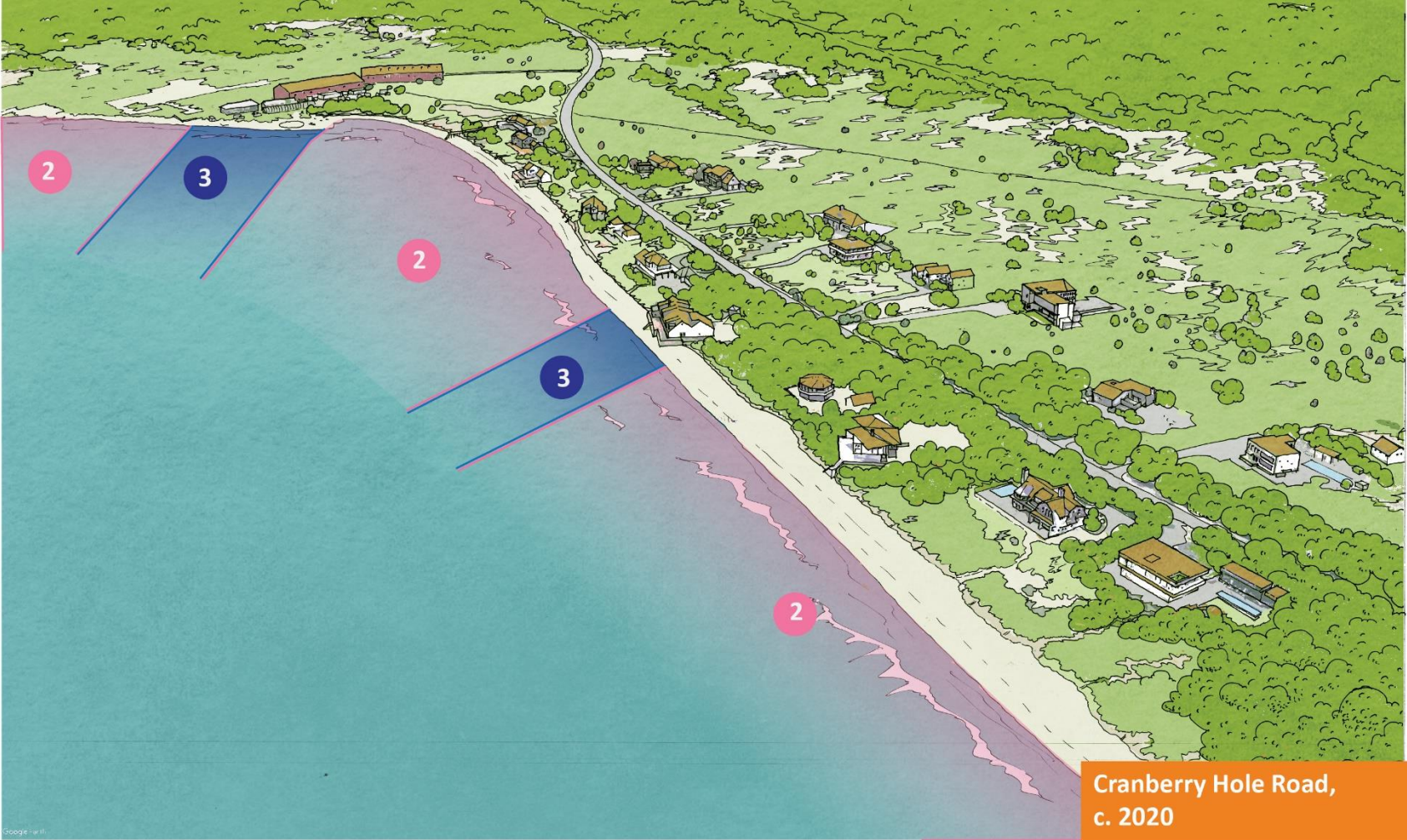
- 1 COASTAL EROSION OVERLAY ZONE 1
- 2 COASTAL EROSION OVERLAY ZONE 2
- 3 COASTAL EROSION OVERLAY ZONE 3
- 4 COASTAL EROSION OVERLAY ZONE 4

Lazy Point, c. 2020

**COASTAL  
EROSION  
OVERLAY  
ZONES**



# Focus Area: Cranberry Hole Road

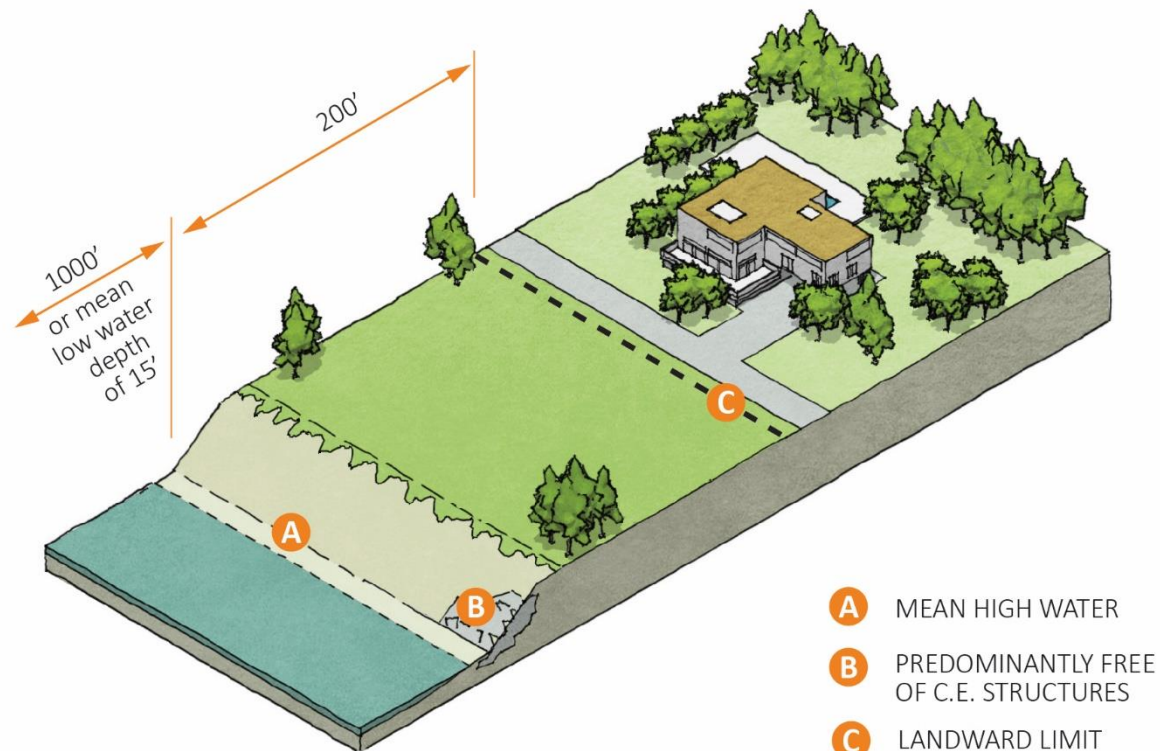


- 1 COASTAL EROSION OVERLAY ZONE 1
- 2 COASTAL EROSION OVERLAY ZONE 2
- 3 COASTAL EROSION OVERLAY ZONE 3
- 4 COASTAL EROSION OVERLAY ZONE 4

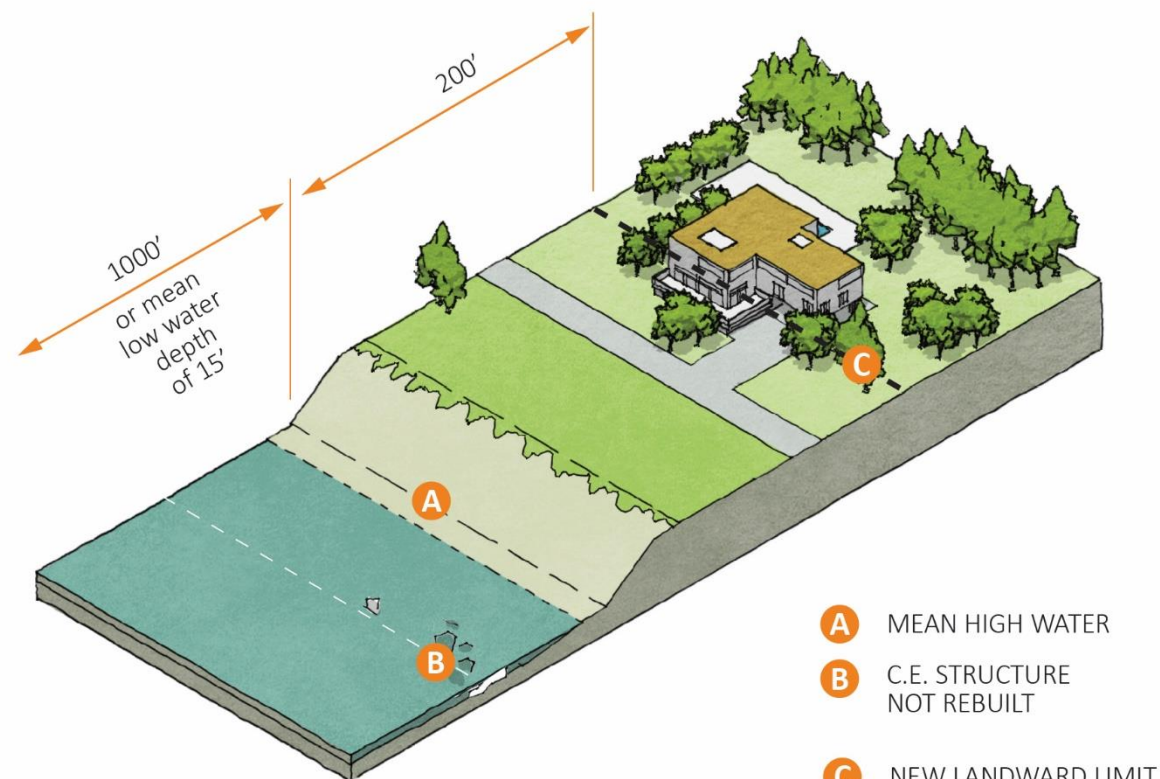
Cranberry Hole Road,  
c. 2020

**COASTAL  
EROSION  
OVERLAY  
ZONES**

# Coastal Erosion Overlay Zone



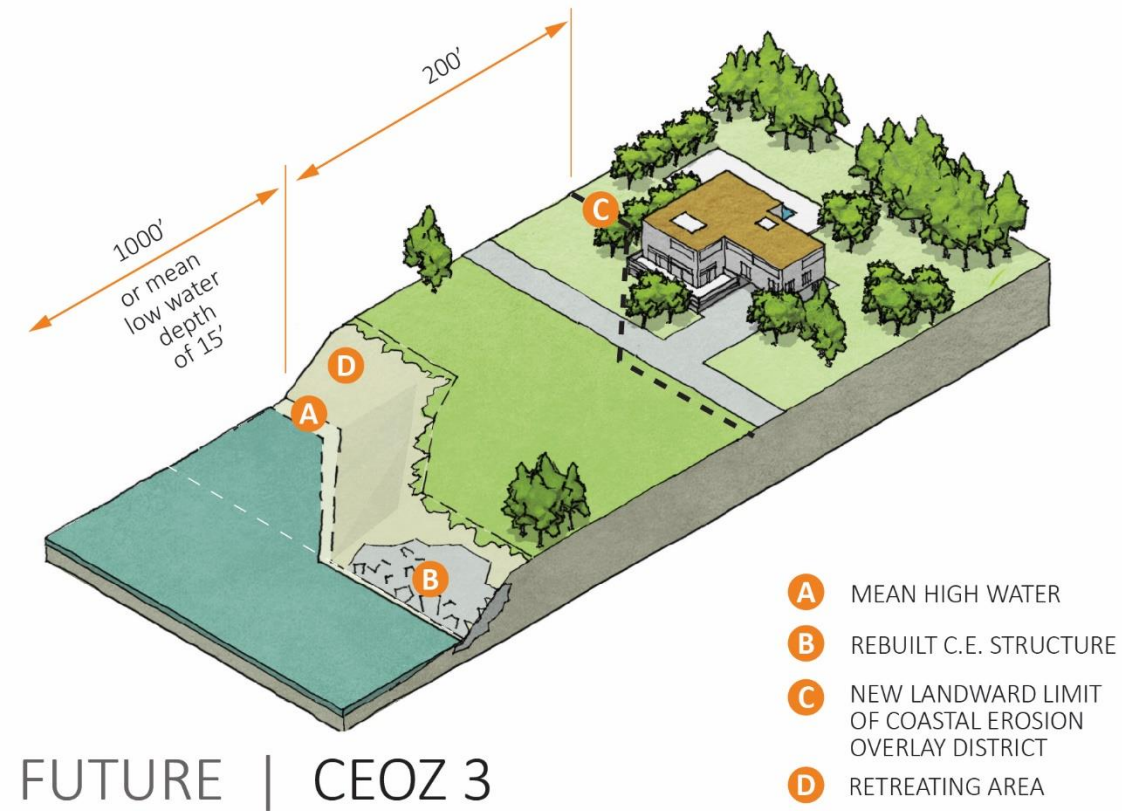
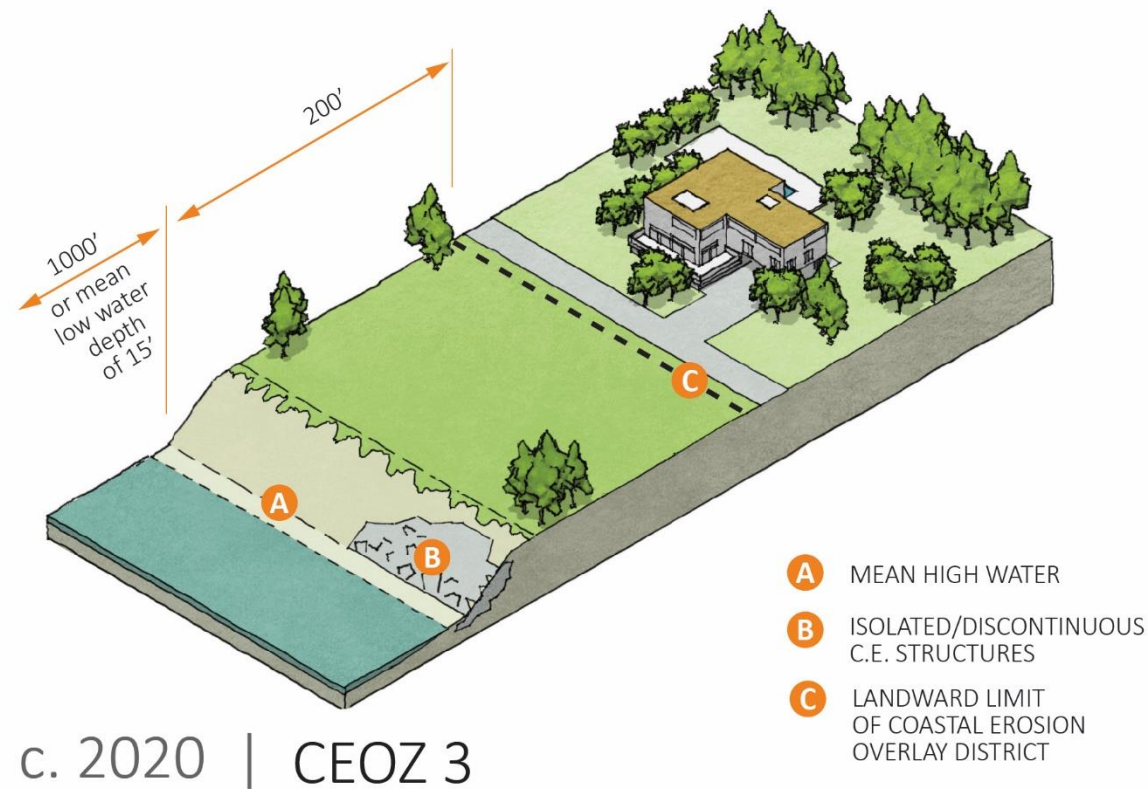
c. 2020 | CEOZ 2



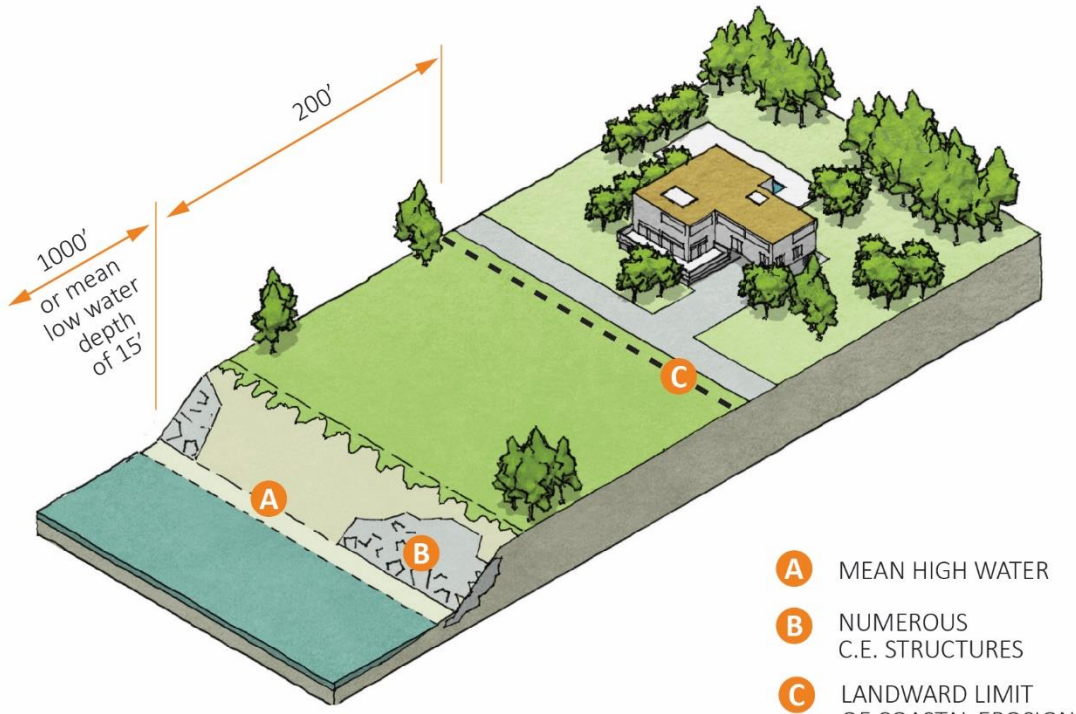
FUTURE | CEOZ 2



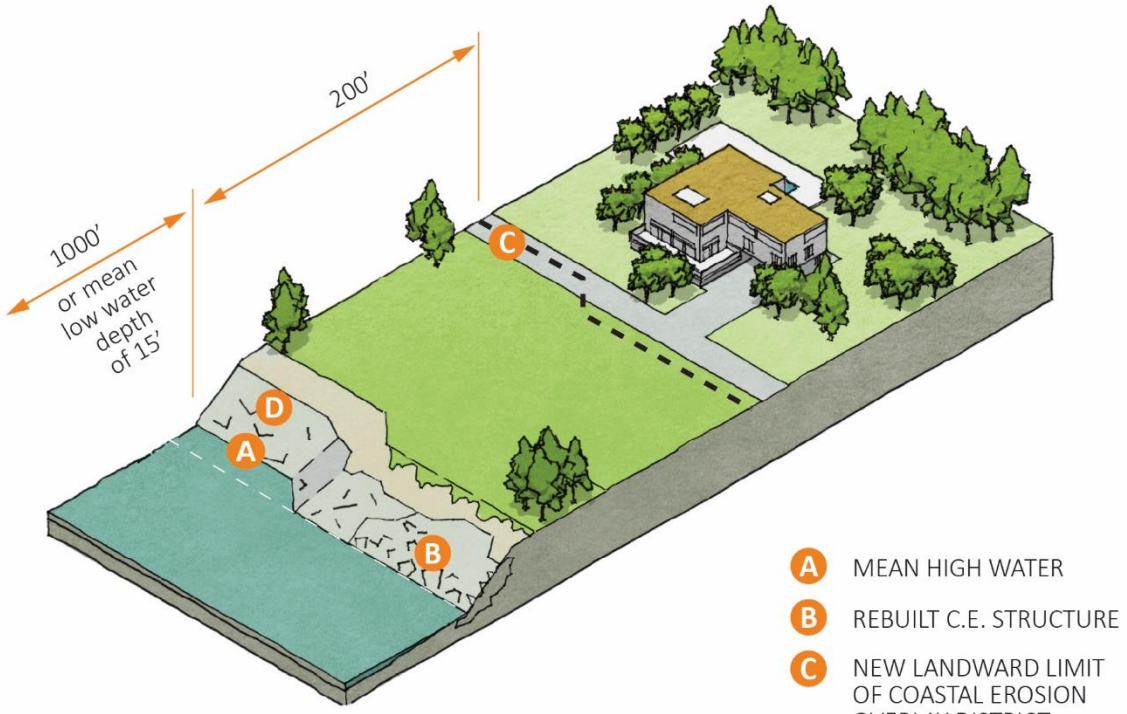
# Coastal Erosion Overlay Zone



# Coastal Erosion Overlay Zone



c. 2020 | CEOZ 4



FUTURE | CEOZ 4

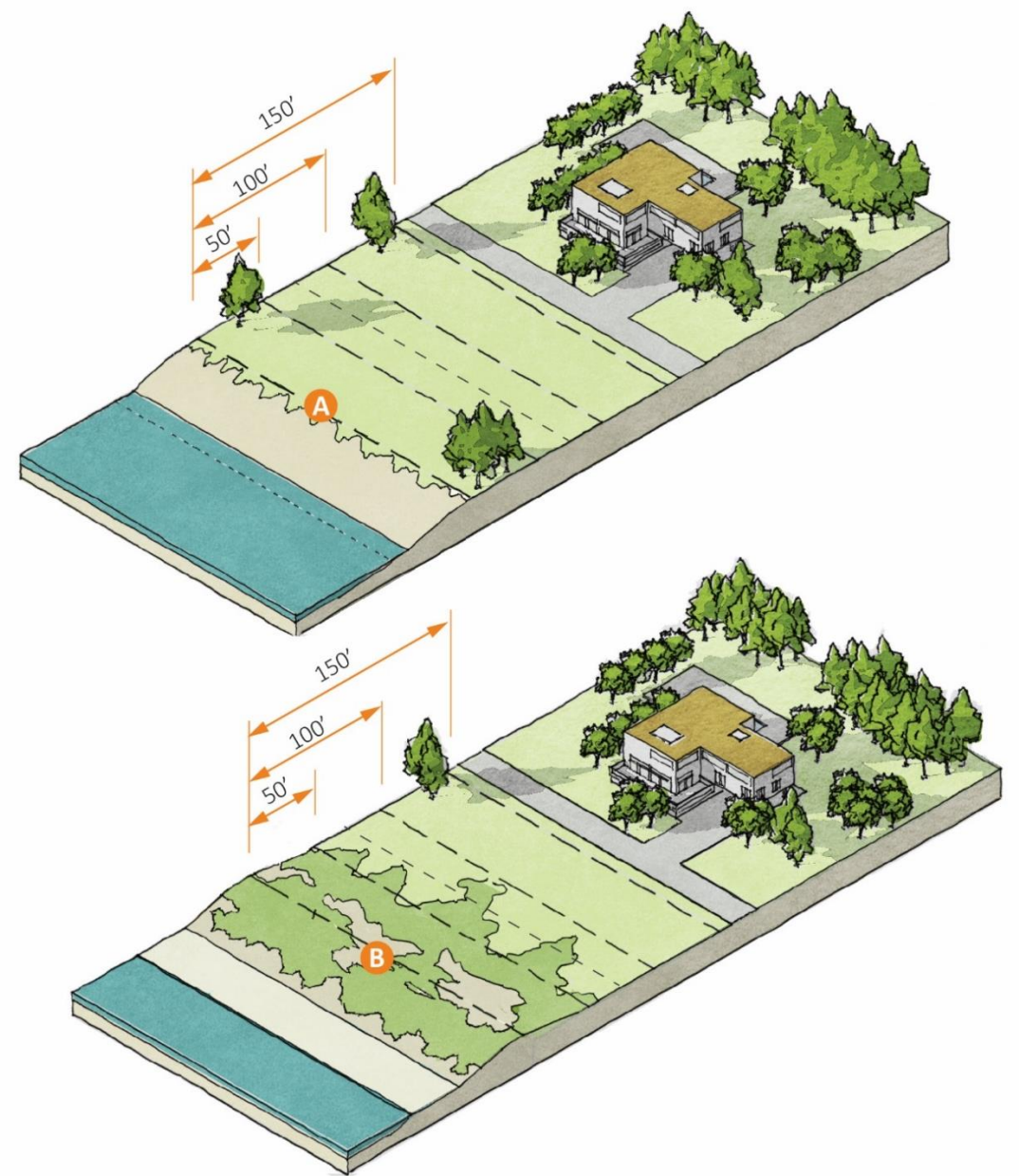


# Coastal Erosion Overlay Zone

## Outer bays and harbors.

Along the shorelines of Northwest Harbor, Gardiner's Bay, Napeague Bay, Fort Pond Bay, and Block Island Sound, no building or other structure shall be erected, constructed, placed, enlarged or reconstructed within the following distances of the bluff line or dune crest or, where no bluff line or dune crest exists, within the following distances of the landward boundary of the beach:

1. On lots having a lot area of less than 30,000 square feet: 75 feet.
2. On lots having a lot area of less than 80,000 but greater than or equal to 30,000 square feet: 100 feet.
3. On lots having a lot area of 80,000 square feet or more: 150 feet.
4. Notwithstanding the foregoing, on lots having a lot area of less than 80,000 square feet, for an addition to a legally preexisting structure that is situated landward of the existing structure, the required setback shall be 50 feet.



## SETBACKS & PERMITTING

- A TOP OF SEAWARD BLUFF
- B SEAWARD DUNE CREST